

## MANUAL

### CONGRATULATIONS

Congratulations on purchasing your new CTEK professional 24 V DC/DC switch mode battery charger, 12 V converter and battery equalizer. This charger is part of a range of professional battery chargers from CTEK SWEDEN AB. It represents the latest technology in battery charging with charging and analysis in 4 steps with temperature compensation.

Read this User Manual and follow the instructions carefully before using your new charger.

### SAFETY

- The charger is designed for 24 V lead-acid batteries mounted into vehicles.  
Do not use the charger for any other purpose
- Use safety glasses when connecting or disconnecting a battery.
- Battery acid is corrosive. Rinse immediately with water if acid comes into contact with skin or eyes. Seek medical advice.
- Make sure that the cables are not being pinched or in contact with warm surfaces or sharp edges.
- While charging, a battery can emit explosive gases, avoid sparks in the immediate area.
- Always provide for proper ventilation during charging.
- Avoid covering the charger.

### D250TS

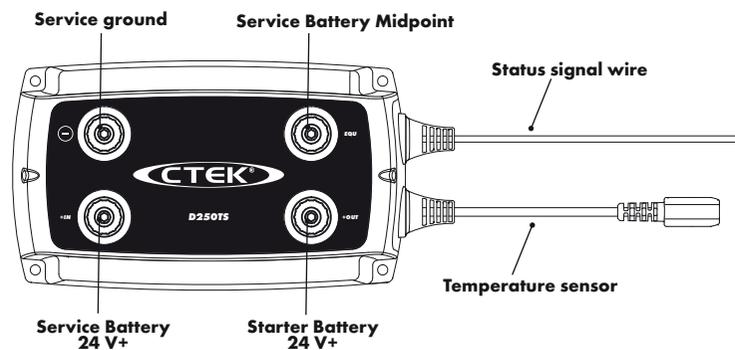
The D250TS has one 24 V input and two alternating outputs. One output charge a 24 V battery and the other provides 50 % of the input voltage to the midpoint of a 24 V system. This enables connection of 12 V consumers to the battery string and also equalizing this battery string, for longer battery life.

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### D250TS

#### FEATURES:

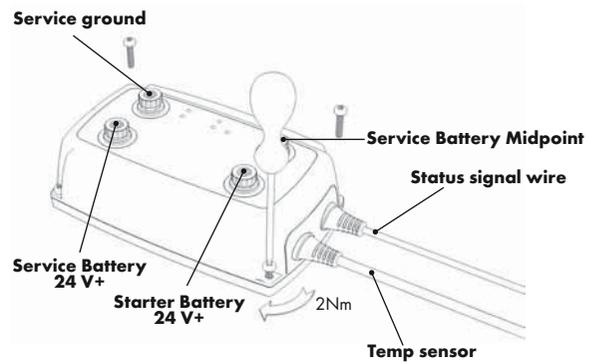
- Multi-step 10 A temperature compensated battery charging and battery maintenance.
- Battery separation of Starter and Service batteries.
- Equalization of Service batteries
- Makes connection of 12 V consumers directly to 24 V Service battery possible.
- When the charger is correctly connected the charger will output 24 V on the status signal wire. Connection of a 24 V lamp (max 2 W) to the status signal wire will indicate a correctly connected charger.
- The charger will maintain the starter battery until the supply is below 14V. To avoid draining the service battery always connect a charger to the service battery when the vehicle is not used for a longer period.



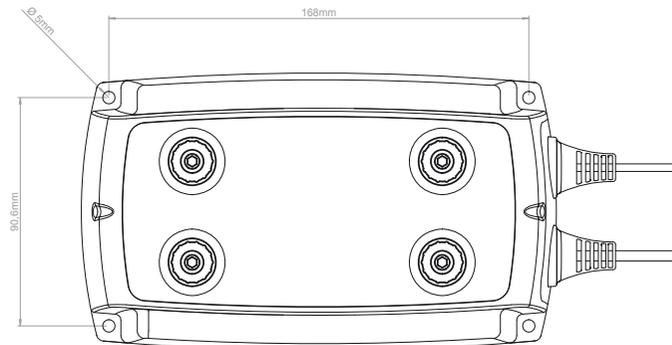
## INSTALLATION OF UNIT

1. Attach the temperature sensor holder on a flat surface on one Starter battery. Position it as close as possible to a positive post.
2. Use the included drill template. Wiring is simplified if the units are installed according to the drill template, but other setups are possible.
3. Install the unit(s) on a flat surface where it can be properly fixed and where the unit is not exposed to fuels, oils or splashes of dirt.
4. Mount the unit with screws intended for the surface and attach it with one screw in each of the four holes in the corners of the unit. See picture 1. Mount the unit with M4 or ST4.2 screws. The required torque depends on the surface for mounting.

Figure 1



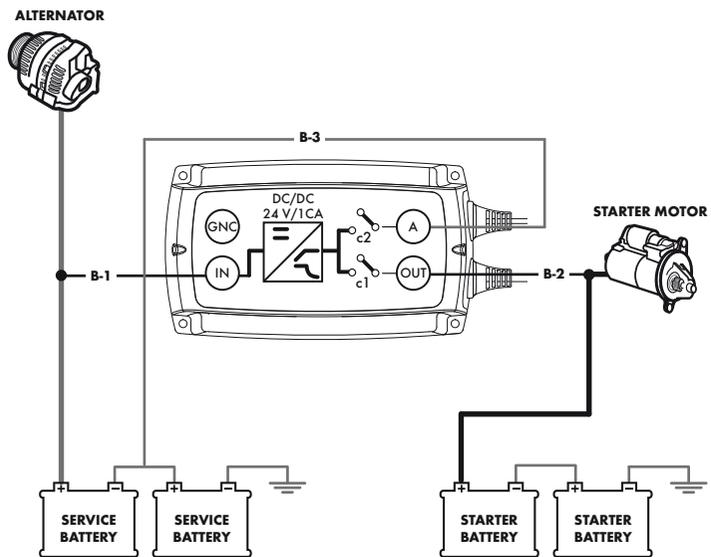
## DRILL TEMPLATE



## FUNCTIONALITY

The D250TS has three operating modes:

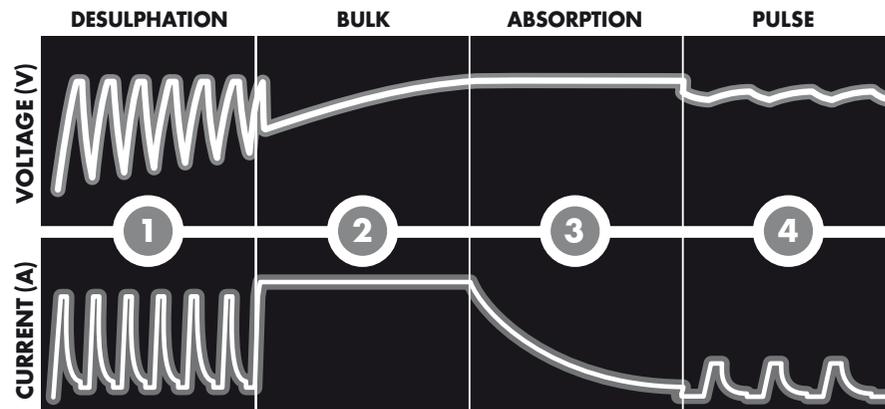
1. 4-step charging of a Starter battery.
2. When Starter battery is fully charged: Equalization of a Service battery on the Input side. This function provides the possibility to connect 12 V consumers to the 1st battery in the Service battery string.
3. Monitoring. The D250TS now monitors if the Starter battery needs charging (priority) or the Service battery needs equalization.



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### CHARGING PROGRAM D250TS

The D250TS will charge the Starter battery in 4 steps. The last step, Pulse maintenance means that the D250TS monitors the Starter battery to see when a new charge pulse is needed. The D250TS use this monitoring time to equalize the Service battery by sending out a voltage of exactly 50 % of the input voltage. This prolongs the Service battery significantly and will also make it possible to connect 12 V consumers to the first battery in the Service battery string. Equalization ends when the Starter battery needs charging or when the two batteries in the Service battery bank have the same voltage.



#### STEP 1 DESULPHATION

Detects sulphated batteries. Pulsing current and voltage, removes sulphate from the lead plates of the battery restoring battery capacity.

#### STEP 2 BULK

Charging with maximum current until approximately 80 % battery capacity.

#### STEP 3 ABSORPTION

Charging with declining current to maximize up to 100 % battery capacity.

#### STEP 4 PULSE

Maintaining the battery at 95-100 % capacity. The charger monitors the battery voltage and gives a pulse when necessary to keep the battery fully charged.

## WIRE DIMENSIONS

MIN WIRE DIMENSIONS					
WIRE	0.5 m	1 m	2 m	5 m	10 m
+IN	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	4 mm <sup>2</sup>	4 mm <sup>2</sup>	4 mm <sup>2</sup>
+OUT	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	4 mm <sup>2</sup>	6 mm <sup>2</sup>	6 mm <sup>2</sup>
+A	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	4 mm <sup>2</sup>	6 mm <sup>2</sup>	6 mm <sup>2</sup>
+SIGNAL	1.5 mm <sup>2</sup>				
-GROUND	1.5 mm <sup>2</sup>				

## TECHNICAL SPECIFICATIONS

<b>Charger model</b>	CTEK D250TS
<b>Model number</b>	1048
<b>Input voltage</b>	14-30 V
<b>Charging voltage</b>	28.8 V at 25°C, temperature compensated. Voltage reduced at higher voltage, increased at lower.
<b>Charging current</b>	10 A
<b>Equalization current</b>	Max 10 A, average pending time used for Starter battery charging
<b>Equalization voltage</b>	50 % of input voltage
<b>Back current drain</b>	<1 Ah/month
<b>Current ripple</b>	<4 %
<b>Ambient temperature</b>	-20°C to +50°C, output power reduced automatically at high temperatures
<b>Status signal</b>	+24 V ON when D250TS is working properly. Max current 500 mA.
<b>Battery types</b>	All types of lead-acid batteries (WET, MF, Ca/Ca, AGM and GEL)
<b>Battery capacity</b>	28-200 Ah
<b>Dimensions</b>	192 x 110 x 65 mm (L x W x H)
<b>Insulation class</b>	IP65
<b>Weight</b>	0.7 kg

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## TEMPERATURE PROTECTION

D250TS has a temperature sensor that is used for adjusting the charge voltage according to Starter Battery temperature. This sensor should be attached to the Starter Battery, if possible, otherwise in it close surrounding.

## LIMITED WARRANTY

CTEK SWEDEN AB, issues this limited warranty to the original purchaser of this product. This limited warranty is not transferable. The warranty applies to manufacturing faults and material defects for 2 years from the date of purchase. The customer must return the product together with the purchase receipt. This warranty is void if the battery charger has been opened, handled carelessly or repaired by anyone other than CTEK SWEDEN AB or its authorised representatives. One of the screw holes in the bottom of the charger is sealed. Removing or damaging the seal will void the warranty. CTEK SWEDEN AB makes no warranty other than this limited warranty and is not liable for any costs other than those mentioned above. For example, consequential damages are not covered. Moreover, CTEK SWEDEN AB is not obligated to any other warranty other than this warranty.

## SUPPORT

CTEK offers professional custom support: [www.ctek.com](http://www.ctek.com). For the latest revised user manual, see [www.ctek.com](http://www.ctek.com). By e-mail: [info@ctek.se](mailto:info@ctek.se), by telephone: +46(0) 225 351 80, by fax: +46(0) 225 351 95. By mail: CTEK SWEDEN AB, Rostugnsvägen 3, SE-776 70 VIKMANSHYTTAN, SWEDEN.

VIKMANSHYTTAN, SWEDEN 2011-09-01



Bengt Hagander, President  
CTEK SWEDEN AB

## CTEK PRODUCTS ARE PROTECTED BY

2011-09-19

Patents	Designs	Trade marks
EP10156636.2 pending	RCD 509617	CTM 669987
US12/780968 pending	US D575225	CTM 844303
EP1618643	US D580853	CTM 372715
US7541778	US D581356	CTM 3151800
EP1744432	US D571179	CTM 1461716 pending
EP1483817 pending	RCD 321216	CTM 1025831
SE524203	RCD 000911839	CTM 405811
US7005832B2	RCD 081418	CTM 830545751 pending
EP1716626 pending	RCD 001119911-0001	CTM 1475420 pending
SE526631	RCD 001119911-0002	CTM 1935061 pending
US7638974B2	RCD 081244	V285731P00
EP1903658 pending	RCD 321198	CTM 1082141 pending
EP09180286.8 pending	RCD 321197	CTM 2010004118 pending
US12/646405 pending	ZL 200830120184.0	CTM 4-2010-500516 pending
EP1483818	ZL 200830120183.6	CTM 410713
SE1483818	RCD 001505138-0001	CTM 2010/05152 pending
US7629774B2	RCD 000835541-0001	CTM1042686
EP09170640.8 pending	RCD 000835541-0002	CTM 766840 pending
US12/564360 pending	D596126	
SE528232	D596125	
SE525604	RCD 001705138 pending	
	US D29/378528 pending	
	RCD 201030618223.7 pending	
	US RE42303	
	US RE42230	