

# USER MANUAL

CTEK DC/DC BATTERY CHARGER **D250T**  
AND 24V POWER MANAGEMENT SYSTEM **SMARTPASS 120T**

**2 YEAR**  
WARRANTY



BC

ZH KO JA PL FI NO DA SV NL IT ES FR DE EN

**CTEK** | MAXIMIZING  
BATTERY  
PERFORMANCE

# MANUAL

## CONGRATULATIONS

on the purchase of your new CTEK charger providing professional battery care. This charger is included in a series of professional chargers from CTEK SWEDEN AB and represents the latest technology in battery charging. With the CTEK D250T and SMARTPASS 120T you will maximize the performance from your dual battery system.

## SAFETY

### CALIFORNIA PROPOSITION 65

**WARNING:** This product contains chemical known to the state of California to cause cancer or reproductive toxicity.

- The D250T and SMARTPASS 120T have been developed for 24V lead-acid batteries. Do not use either of these units for any other type of battery.
- Wear protective goggles when connecting and disconnecting batteries.
- Battery acid is corrosive. Rinse with plenty of water immediately if you get acid on your skin or in your eyes. Get medical assistance.
- Never use a charger with damaged electric cables. Check that the cables have not been damaged by hot surfaces, sharp edges or in any other way.
- Explosive gases are generated while lead-acid batteries are being charged. Avoid any sparking near the battery. Install the devices in a well-ventilated area to ensure that the unit will not be overheated.
- Never place the charger above the battery, and do not cover the charger during charging.
- Disconnect the battery terminal posts before installing.
- The D250T and SMARTPASS 120T are not spark-free.
- The installation must include a fuse in accordance with the recommendations in the table "CABLE AND FUSE REQUIREMENTS" contained within this manual.



#### WARNING!

The D250T and SMARTPASS 120T are not protected against reversed polarity. Disconnect the battery terminal posts before installation.



#### WARNING!

The D250T and SMARTPASS 120T are not spark-free. Ensure good ventilation.

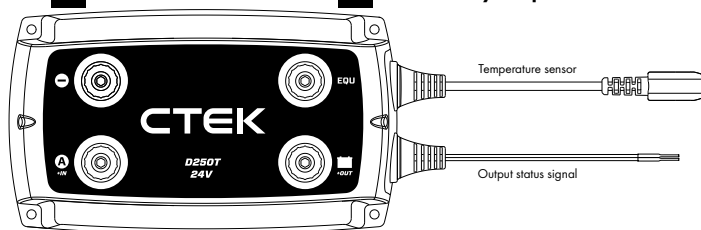
**Remember that all installations in boats must comply with ISO 10133!**

1. The cabling from the batteries must have fuses near the batteries.
2. The batteries must be securely fastened in a ventilated space.
3. The cabling must be run through pipe ducting, separately from 230V/110V wiring (mains power), or secured by clips at every 30 cm/1 ft.
4. Cabling in the engine compartment must be temperature rated at 70°C/ 158°F.

## D250T

Earth Connection

Start Battery Midpoint



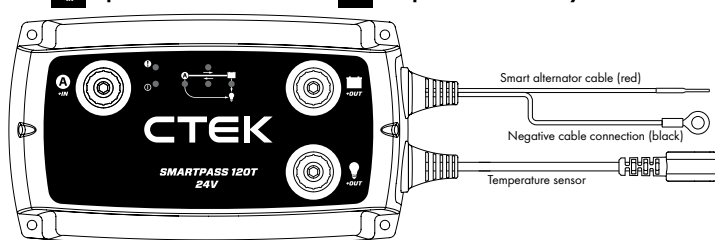
Input Alternator

Output Service battery

## SMARTPASS 120T

Input Alternator

Output Service battery



Output Non-critical Consumers

Connector plate

## D250T

### FUNCTIONS

- **General**  
D250T is a 24V DC-DC battery charger for a dual battery system with a starter battery and a service battery. D250T is designed to be used as an onboard charger, for charging and maintaining a 24-volt service battery from the vehicle alternator when motor is running.
- **Charging**  
D250T uses a 4-step automatic charging algorithm to charge the service battery with up to 10A when a conventional alternator (constant voltage) is running.
- **Starter battery under voltage protection**  
The charging process is automatically switched off when the engine is not running to prevent discharge of the starter battery.
- **Temperature compensation**  
The external temperature sensor will adjust the charge voltage according to actual temperature of the service battery. The charge voltage is reduced at higher temperatures and is increased at lower temperatures. The temperature sensor should if possible be attached to the Service Battery, or as close to it as possible. (see figure 4)
- **Battery separation**  
D250T separates the starter battery from the service battery when the engine is not running. The battery separation protects the starter battery from being discharged, this eliminates the needs for diodes and VSR relays.
- **Service battery temperature protection**  
The external temperature sensor attached to the service battery is protecting the service battery from high temperatures by switching off the charging process if the measured temperature rises too high. The charger will automatically restart when the service battery temperature reduces to a level level within the specified operating temperature.
- **Equalizing the starter battery**  
In a 24V system, where we have two 12V batteries in series, the voltage in the two batteries can be unbalanced, especially if there are 12V consumers connected to one of the batteries. When the service battery is fully charged, the D250T will measure the voltage levels in both 12V starter batteries. If there is a difference between the voltage in these two batteries, the D250T will equalize the voltage levels to increase battery performance and lifetime.

## D250T

- **Protects service battery from overcharging**  
D250T will not overcharge the service battery. When the service battery is fully charged D250T will go into pulse charging mode to monitor and maintain the charge status battery. If battery voltage drops too low the charging process will restart.
- **SMARTPASS 120T**  
Fully compatible with SMARTPASS 120T to provide the ultimate power management solution for dual battery systems.
- **Remote status indicator lamp**  
There are no LED indicator lamps on the units themselves but there is a status signal lead attached to the charger. This can be connected to a 24V lamp (Max. 2W) for remote indication of charger status, in the driver's cab or other places where indication is needed.

## SMARTPASS 120T








### FUNCTIONS

- **General**  
SMARTPASS 120T is a Power Management Solution which distributes, controls and maximizes available energy from the vehicle alternator to service batteries and other consumers. SMARTPASS 120T connects the service battery to the alternator/starter battery in order to split charge and deliver up to 120A continuously to the service battery and parallel consumers.
- **Split charging**  
SMARTPASS 120T connects the service battery to the starter battery when the alternator is running, or when the starter battery voltage is kept above a set threshold by another power source, for example an external battery charger.
- **Battery separation**  
SMARTPASS 120T separates the starter battery from the service battery when the engine is not running. The battery separation protects the starter battery from being discharged, this eliminates the needs for diodes and VSR relays
- **Service Battery guard (Deep discharge protection)**  
Turns off all the equipment connected to the SMARTPASS 120T consumer output when service battery voltage is low, this protects the service battery from deep discharge and will extend battery life. The consumer output will reconnect when service battery voltage has increased back to a level within specified operating range.
- **Critical consumers**  
If there are some consumers with low power consumption that must be prioritized (critical consumers), they can be connected directly to battery. This will ensure they are always connected to the service battery. Please note: by connecting consumers directly to the service battery, the SMARTPASS 120T can no longer protect against deep discharge.
- **Assigning current source priority**  
When the alternator is running, the SMARTPASS 120T will supply consumers with current directly from the starter battery (alternator). This feature will maximize the charging efficiency when a D250T is used in the system as no consumers will take any power from service battery.
- **Dynamic overcurrent protection**  
SMARTPASS 120T can handle temporary inputs and outputs of up to 350A for fast charging. It has an overcurrent protection and internal temperature monitoring to protect electronic circuits and keep the electronics within safe operation.

## SMARTPASS 120T

- **Smart Alternator**  
SMARTPASS 120T can also be used when vehicle is equipped with a smart alternator (with variable charging voltage). This is activated by connecting the red smart alternator cable according to the instruction in this manual.
- **Overvoltage protection**  
The Alternator input is electronically overvoltage protected. If voltage from alternator is too high SMARTPASS 120T will turn off the connection to service battery and consumers.
- **Service battery temperature protection**  
SMARTPASS 120T is equipped with a temperature sensor to be attached to the service battery pack. This protects the battery by switching off the connection between starter battery and service battery if the service battery temperature is too high, i.e. not allowing charge from the alternator to the service battery.
- **Starter battery trickle charging**  
When the service battery voltage is higher than the starter battery, the SMARTPASS 120T will trickle charges the starter battery by periodically connecting the service battery output to the alternator input. This can be helpful to compensate for the self-discharge of the starter battery. It is especially useful if another power source is feeding the service battery, for example a battery charger.
- **Compatible with D250T**  
To get the optimal dual battery management system the SMARTPASS 120T should be combined with D250T DC-DC charger to get a stable, reliable and optimized charging system. D250T and SMARTPASS 120T can together charge the service battery and provide the consumers up to 130A of power.
- **Overvoltage protection**  
Alternator input is electronically overvoltage protected. If voltage from the alternator is too high the SMARTPASS 120T will disconnect the connection to the service battery and consumers. When voltage is back within the normal range SMARTPASS 120T will automatically open the connections.




## CABLE AND FUSE REQUIREMENTS

UNIT	CABLE	MIN. CABLE SIZE					FUSE
		0.5 m 2 ft	1 m 3 ft.	2 m 6 ft.	5 m 15 ft.	10 m 30 ft.	
D250T	+IN 	2.5 mm <sup>2</sup> / AWG14	2.5 mm <sup>2</sup> / AWG14	4 mm <sup>2</sup> / AWG12	4 mm <sup>2</sup> / AWG12	6 mm <sup>2</sup> / AWG10	15A
	+OUT 	2.5 mm <sup>2</sup> / AWG14	4 mm <sup>2</sup> / AWG12	6 mm <sup>2</sup> / AWG10			15A
	EQU 	2.5 mm <sup>2</sup> / AWG12	2.5 mm <sup>2</sup> / AWG12	4 mm <sup>2</sup> / AWG12	4 mm <sup>2</sup> / AWG12	6 mm <sup>2</sup> / AWG12	15A
	+SIGNAL	1.5 mm <sup>2</sup> / AWG16	1.5 mm <sup>2</sup> / AWG16	1.5 mm <sup>2</sup> / AWG16	1.5 mm <sup>2</sup> / AWG16	1.5 mm <sup>2</sup> / AWG16	
	-EARTH 	1.5 mm <sup>2</sup> / AWG16	1.5 mm <sup>2</sup> / AWG16	1.5 mm <sup>2</sup> / AWG16	1.5 mm <sup>2</sup> / AWG16	1.5 mm <sup>2</sup> / AWG16	
	Connector plate*	2.5 mm <sup>2</sup> / AWG14	4 mm <sup>2</sup> / AWG12	6 mm <sup>2</sup> / AWG10			
SMARTPASS 120T	+IN 	35 mm <sup>2</sup> / AWG2	35 mm <sup>2</sup> / AWG2	35 mm <sup>2</sup> / AWG2	50 mm <sup>2</sup> / AWG1	50 mm <sup>2</sup> / AWG1	300A
	+OUT  	35 mm <sup>2</sup> / AWG2	35 mm <sup>2</sup> / AWG2	35 mm <sup>2</sup> / AWG2			300A

\*If the D250T and SMARTPASS 120T are installed in different locations and the accompanying connector plate is not used, please follow the recommendations in the table.

## FUNCTION INDICATIONS - D250T

There are no LED indicator lamps on the units themselves but there is a status signal lead attached to the charger. This can be connected to a 24V lamp (Max. 2W) for remote indication of charger status, in the driver's cabinet or other places where indication is needed.

Signal	Description
	Not enough input voltage to charger. System is shut off, no charging is in progress.
	The system is ON and is working properly.
	Major fault.

## FUNCTION INDICATIONS - SMARTPASS 120T

### Error lamp



**OFF:** No errors detected.

**ON:** Error detected.

In combination with flashing LED you will get more information about the error. See also section "Error indication".

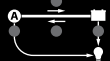
### Power lamp



**OFF:** Incoming voltage too low, no power to device.

**ON:** Power on.

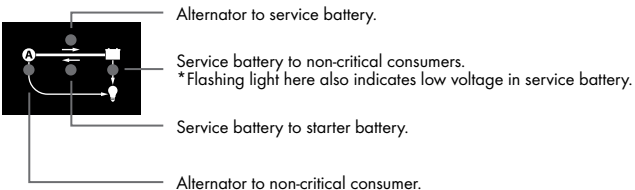
### Connection gates



**OFF:** Gate is closed and no current is passing through.

**ON:** Gate is open and current is passing through.

**FLASHING\*:** Gate error due to high current or high temperature.



## INSTALLATION

The installation should be done by a person with knowledge of automotive installations.

1. The D250T & SMARTPASS 120T unit(s) should not be directly exposed to fuel, oil or dirt. They should be installed on a flat surface to ensure they can be firmly secured. If you are fitting both units together attach the accompanying connector plate (see Figure 3) before fitting them into the vehicle.
2. Secure the unit(s) with M4 or ST4.2 screws at each corner (see Figure 1).
3. Before connecting the cables, ensure that the negative terminal post on both the starter and service battery is not connected.
4. Connect the cables to the unit connections by securing the M8 screws with the required tightening torque. (see Figure 2). Use an Allen key - tightening by hand without a tool is not enough. The cables connected to M8 terminals must be equipped with ring terminals. Max thickness of connected ring terminal(s) is 6mm (see figure 5).
5. Use tape (see Figure 4) to secure the temperature sensor to a clean flat surface above the service battery. Position the sensor as close to the positive terminal post as possible.
6. Connect the battery negative terminal post.

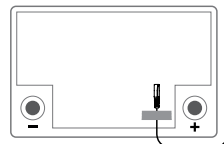


Figure 4



### WARNING!

The D250T and SMARTPASS 120T are not protected against reversed polarity. Disconnect the battery terminal posts before installation.



### WARNING!

The D250T and SMARTPASS 120T are not spark-free. Ensure good ventilation.

## REQUIRED TIGHTENING TORQUES

Figure 1

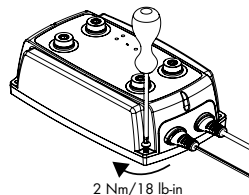


Figure 2

8 Nm/71 lb-in

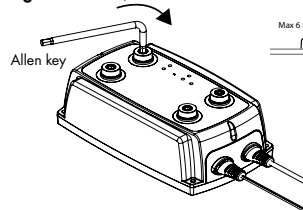
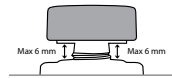
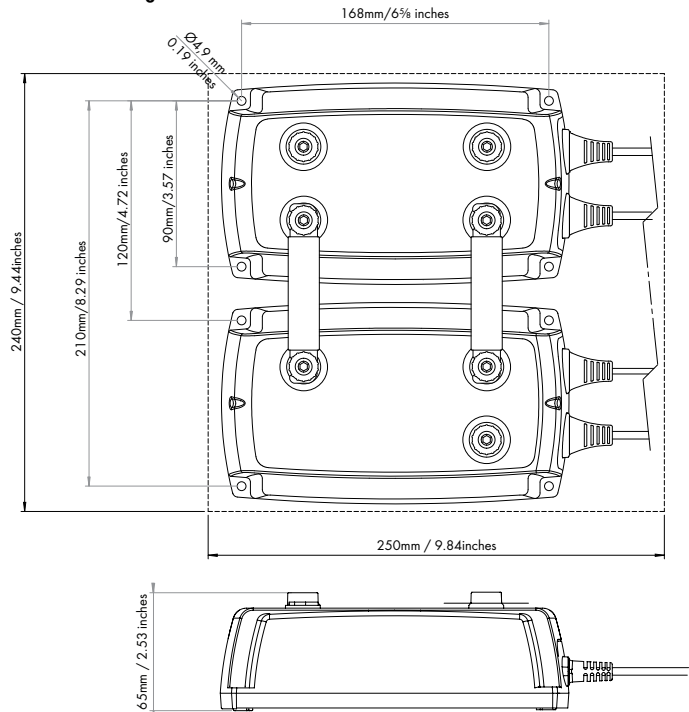


Figure 5



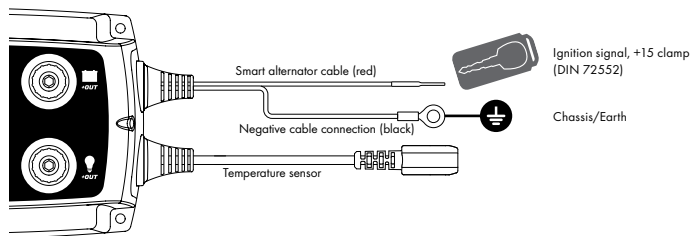
## DIMENSIONS

Figure 3



## SETTINGS SMARTPASS 120T

Smart alternator cable (red)	Type of alternator
Not connected	Conventional alternator
Connected	Smart alternator



## DEFINITIONS AND DESCRIPTIONS

### STARTER BATTERY

A battery intended for the engine's electric starter motor in automotive applications. A starter battery should never be deeply discharged.

### SERVICE BATTERY

Service battery is an auxiliary battery that will provide power to electrical equipment when the vehicle motor is not running. This additional battery will prevent the starter battery to be being drained and protect against a flat battery. Suitable deep cycle batteries should be used.

### TEMPERATURE SENSOR

The D250T optimises the charge voltage by increasing the charge voltage at temperatures below 25°C/77°F and reducing it at temperatures higher than 25°C/77°F.

### TEMPERATURE COMPENSATED CHARGE VOLTAGE

The charger will adjust the charge voltage according to service battery temperature. This can be done by attaching the temperature sensor to the starter battery or somewhere close to the battery.

### BATTERY TEMPERATURE PROTECTION

Protects the battery by switching off charging if the temperature rises too high.

### FUSES

Fuses must be used for overload protection. Mount the fuses as close to each battery as possible. Please see this instruction manual for recommended fuse sizes - see "CABLE AND FUSE REQUIREMENTS" table.

### WIRING

Please see this instruction manual for recommended cable length and sizes - see "CABLE AND FUSE REQUIREMENTS" table.

### CONSUMERS

Consumers should normally be connected to the consumer output terminal on the SMARTPASS 120T. If battery voltage reaches a critically low level, the consumer output terminal is deactivated to protect the service battery from being deeply discharged.








When the vehicle motor is running, non-critical consumers receive current from the alternator instead of the service battery, for faster charging of the service battery.








If there are some consumers with low power consumption that must be prioritized (critical consumers), they can be connected directly to battery. This will ensure they are always is connected to the service battery. Please note: by connecting consumers directly to the service battery, the SMARTPASS 120T can no longer protect against deep discharge. A critical consumer could be a ticket system, life support equipment, communication radio etc.

### EQUALIZING (EQU)

In a 24V system where we have two 12V batteries in series the voltage in the two batteries can be unbalanced, especially if there are 12V consumers connected to one of the batteries. The Equalizing process is balancing the voltage level in the two batteries and ensures battery performance and extends battery life.

## SYMBOLS AND TERMINALS

Fuse		See "CABLE AND FUSE REQUIREMENTS"	
Flashing lamp		Continuously lit lamp	
Alternator		Non critical consumer	
Earth connection		Critical consumer	

Connection	D250T	Connected to
Equalization	<b>EQU</b>	Mid point of starter battery
Input Alternator		<ul style="list-style-type: none"> <li>Starter battery</li> <li>Input Alternator SMARTPASS 120T via connector plate or cable</li> </ul>
Output Service battery		<ul style="list-style-type: none"> <li>Service battery</li> <li>Output Service battery SMARTPASS 120T</li> </ul>
Earth Connection		<ul style="list-style-type: none"> <li>Chassis/Earth</li> <li>Solar panel (-)</li> <li>SMARTPASS 120T (-)</li> </ul>
Connection	SMARTPASS 120T	Connected to
Input Alternator		<ul style="list-style-type: none"> <li>Starter battery</li> <li>Input Alternator D250T via connector plate or cable</li> </ul>
Output Service battery		Output Service battery D250T
Output Consumers		Non-critical consumers
Smart generator (red cable)		See "SETTINGS SMARTPASS 120T"



# INSTALLATION EXAMPLES

## 1. Small service battery

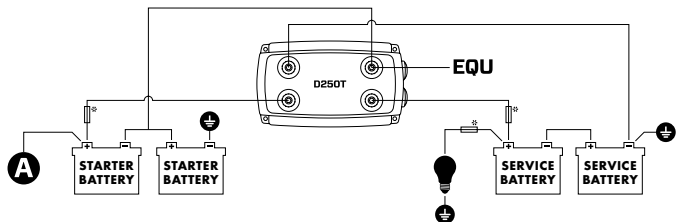
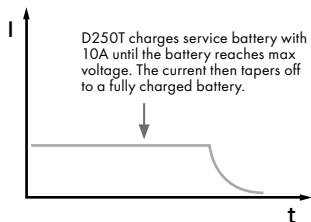
### PREREQUISITES

A dual battery system, where the D250T charges a service battery from the vehicle alternator when the motor is running.

Use this installation when the priority is to charge and maintain the service battery with the optimum charge voltage, and when there are no, or minor, parallel consumers that need power when the vehicle is running. Parallel loads will reduce available charge current and extend charging times. If you are charging parallel consumers, we recommend you also install a SMARTPASS 120T. See installation example #3.

Use this installation when:

- Priority to charge the service battery with optimum voltage.
- No or minor parallel consumers to Service battery.
- Service battery capacity up to approx. 150 Ah, for larger batteries the charging time will be too long.



\*See "CABLE AND FUSE REQUIREMENTS"

## 2. Service battery with parallel consumers

### PREREQUISITES

SMARTPASS 120T connects the service battery with the alternator/starter battery in order to split charge and supply up to 120A continuously to the service battery and parallel consumers.

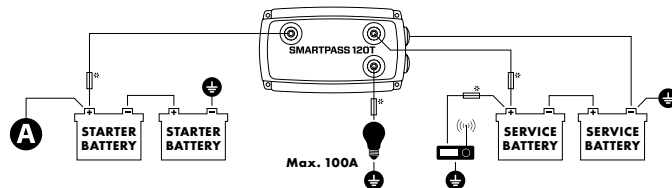
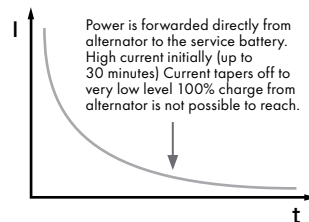
Use this installation when the priority is to manage larger consumers parallel to the service battery that require power when the vehicle is running.

One basic condition required for this installation is that the alternator can deliver sufficient voltage to supply equipment and split charge the service battery. If the alternator is not able to provide enough voltage to fully charge the battery, the SMARTPASS 120T will not either. In this case, we recommend that you also install the D250T DC/DC charger.

Connect the cabling from the starter and service batteries respectively to the SMARTPASS 120T and not to the D250T.

Use this installation when:

- Large electrical consumers parallel to service battery.
- Alternator able to provide the desired voltage
- Power management is priority.
- Larger service battery capacity up to 800 Ah.



\*See "CABLE AND FUSE REQUIREMENTS"

### 3. Large service battery with parallel consumers

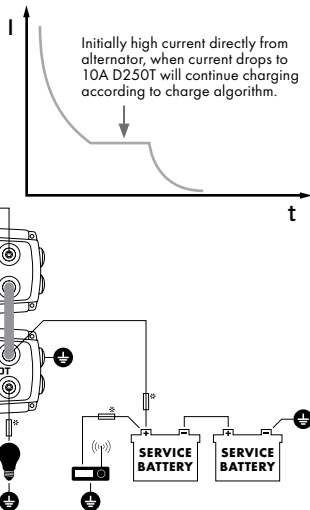
#### PREREQUISITES

A dual battery system where the D250T, together with SMARTPASS 120T, will charge the service battery when the vehicle motor is running, and it will also manage available power from the alternator to both the service battery and parallel consumers.

This installation will give a system that both can manage large parallel loads and at the same time charge maintain the service battery, with the optimum voltage for a 24V dual battery system. The battery charging will be more efficient and shorter as we are getting access to a higher current initially, parallel consumers will be powered directly from alternator.

Use this installation when:

- Large electrical consumers parallel to service battery need power when the motor is running.
- Need onboard charging and maintenance of the service battery.
- Large service battery capacity (up to 800 Ah).
- A safe and reliable onboard charging and power management system is required.



\*See "CABLE AND FUSE REQUIREMENTS"

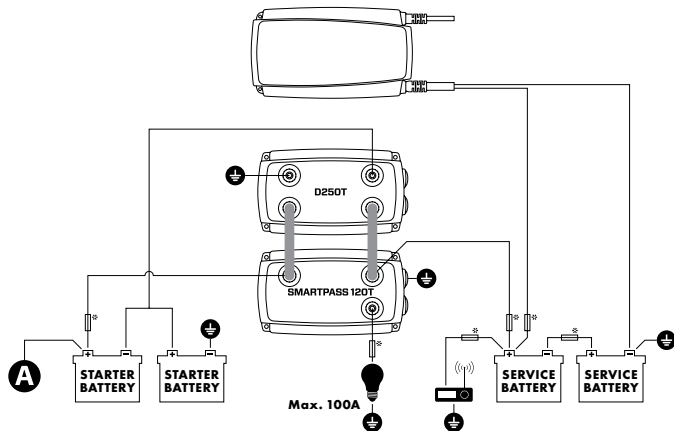
### 4. Connect an AC/DC charger

An AC/DC battery charger can be connected to the service battery as complement to D250T and SMARTPASS 120T. This can be useful if:

- Power from the alternator, when the engine is running, is not enough to fully charge the service battery. Additional charge is needed to fill the battery up to 100%.
- Maintenance charging of the service battery (and starter battery) during long time storage of vehicle. The AC/DC charger will ensure that the batteries are fully charged when the vehicle should be used again.
- You will have access to AC power at your destination. The AC/DC charger will charge the battery and act as power supply for connected consumers.

- Select the size of AC/DC battery charger suitable for the size of the battery and all consumers that are active whilst charging. For example: A 10A charger will not charge a battery at all if you have a 10A light turned on.

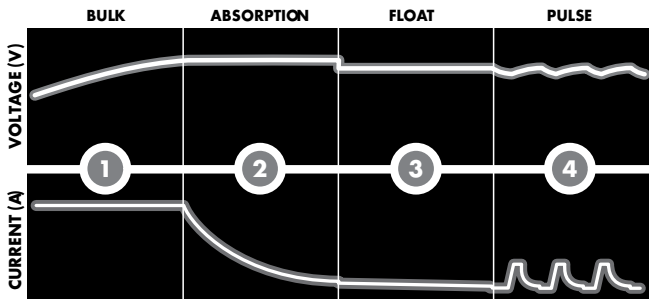
Tips: If the starter battery needs charging, it is possible to connect the AC/DC charger to the starter battery and the D250T and SMARTPASS 120T will charge and maintain to the service battery in at the same time.



\*See "CABLE AND FUSE REQUIREMENTS"

## CHARGING PROGRAM D250T

The D250T will charge the service battery in 4 steps - Bulk, Absorption, Float and Pulse. The last step, Pulse maintenance, means that the D250T monitors state of charge of the service battery, keeping the battery fully charged without risk of overcharging. During this step, the D250T will also monitor state of charge of the starter battery set, sending out voltage to each battery separately to equalize the two 12V batteries - this will significantly extend battery life. Equalization ends when the service battery needs charging or when the two batteries in the starter battery set have the same voltage.



### STEP 1 BULK

Charging with maximum current until approximately 80% battery capacity.

### STEP 2 ABSORPTION

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

### STEP 3 FLOAT

Maintaining the battery voltage at maximum level by providing a constant voltage charge.

### 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.

## SMARTPASS 120T FAULT INDICATIONS

Each LED indicator lamp works individually and a flashing light is indicating an error according to description below.

Note that several combinations can be possible if there is more than one errors. For further details please refer to the manual - see "FUNCTION INDICATIONS" table.

**Reason:** Internal temperature too high and/or current too high in connection between alternator/starter battery and service battery. Note that both lamps will flash to even if an error only occurs from one direction.

**Recommendation:** Check service/starter battery with a battery tester, the service/starter battery may be too deeply discharged and need reconditioning or replacing. This error can also occur if the loads are too big and it can help to reduce the use of electric consumers.



**Reason:** Internal temperature too high and/or current too high in connection from service battery to non-critical consumer. This lamp will also indicate if battery voltage is too low and the battery guard is activated, this will disconnect power to the non-critical consumers.

**Recommendation:** Reduce the use of electrical consumers, consider moving the D250T and/or SMARTPASS 120T to a cooler location with better ventilation or charge the battery.

**Reason:** Internal temperature too high and/or current too high in the connection from alternator to non-critical consumer.

**Recommendation:** Reduce the use of electrical consumers and consider moving the D250T and/or SMARTPASS 120T to a cooler location with better ventilation.

The indication combination below is indicating overheating error



**Reason:** Service battery is overheating.

**Recommendation:** Check the service battery with a battery tester and/or check the installation.

## TECHNICAL SPECIFICATION

PRODUCT	D250T	SMARTPASS 120T
<b>Model number</b>	1048	2003
<b>Input</b>	25.6-32V, 10-15A	22.8-32V
<b>Output battery</b>	28.8V at +25°C, Max. 10A	Max. 120A continuously. Intermittent up to 350A.
<b>Output consumer</b>		Max. 100A***
<b>Back current drain</b>	Less than 1Ah/month	Less than 9Ah/month
<b>Ripple*</b>	Less than 4%	Not applicable
<b>Ambient temperature</b>	-20°C to +50°C (-4°F to +122°F)	
<b>Temperature-compensated charging voltage</b>	28.8V at +25°C, voltage reduced at higher temperatures and is increased at lower.	
<b>Battery types</b>	All types of lead-acid batteries (WET, MF, Ca/Ca, AGM, GEL)	
<b>Recommended battery capacity</b>	28-150Ah	28-800Ah
<b>Dimensions/Weight</b>	192 x 110 x 65mm (L x W x H) / 0.7 kg (1.5 lbs)	
<b>Enclosure class</b>	IP65 (splash and dust proof)	
<b>MPPT**</b>	No	No
<b>Conventional alternator cut-in</b>	>26.2V, for 5 sec. (engine running, alternator charging)	>26.2V, for 4 sec. (engine running, alternator charging)
<b>Conventional alternator cut-out</b>	<25.6V, for 5 sec. (engine running, alternator not charging)	<25.5V, for 4 sec. (engine running, alternator not charging)
<b>Smart alternator cut-in</b>	Not applicable	>23.6V, for 4 sec. (engine running, alternator charging)
<b>Smart alternator cut-out</b>	Not applicable	<22.8V, for 4 sec. (engine running, alternator not charging)
<b>Battery guard cut-in (Service battery)</b>		<23.0V (5s)
<b>Battery guard cut-out (Service battery)</b>		>24.0V (5s)
<b>Temperature protection cut-in</b>	>70°C (158°F)	>60°C (140°F)
<b>Trickle charge starter battery</b>		Starter battery 18V-25.2V.

\*) The quality of the charge voltage and charge current is very important. A high current ripple heats up the battery which has an aging effect on the positive electrode. High voltage ripple could harm other equipment that is connected to the battery. CTEK battery chargers produce very clean voltage and current with low ripple.

\*\*) MPPT (Maximum Power Point Tracker) finds the best combination of current and voltage so that the output power is maximised.

\*\*\*) Total max output current for Smartpass is 120A and available current from alternator will be distributed into the two different output channels, Output Battery and Output Consumer. Specified values is the maximum current for each output.

## **LIMITED WARRANTY**

CTEK 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. The customer must return the product together with the receipt of purchase to the point of purchase. This warranty is void if the product has been opened, handled carelessly or repaired by anyone other than CTEK or its authorised representatives. One of the screw holes in the bottom of the product may be sealed. Removing or damaging the seal will void the warranty. CTEK makes no warranty other than this limited warranty and is not liable for any other costs other than those mentioned above, i.e. no consequential damages. Moreover, CTEK is not obligated to any warranty other than this warranty.

## **SUPPORT**

Visit: [www.ctek.com](http://www.ctek.com) for support, FAQ, the most recent version of the user instructions and further information concerning CTEK products.