Dangerous deep discharging of a battery

If a battery is discharged completely and beyond (deep discharge), the so-called lead (loss of inner surface) of the negative electrode occurs, resulting in an irreversible loss of capacity. In addition, the lead sulphate crystals (sulphation) also grow and reduce the usable capacity. There is also an increased risk of micro-shorts, which increase the self-discharge of the battery or even lead to cell closure.

Therefore, a deep discharge must be avoided in any case to prevent premature battery failure. A deep discharge protection protects the batteries from a harmful deep discharge by switching off the loads when the lower voltage limit is reached. The batteries are automatically switched on again when they are charged.

Two stage deep discharge protection for optimal protection of your batteries

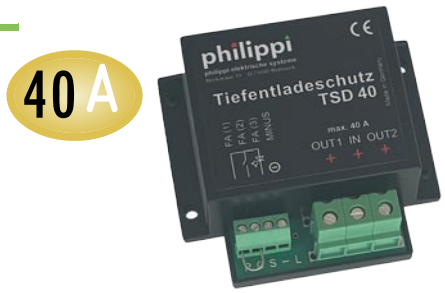
The remotely controllable deep discharge protection TSD 40 protects the battery(ies) from damage due to deep discharge. Conventional devices switch off connected loads in one go. With the two-stage deep discharge protection you can continue to operate important or safety-relevant loads, while luxury loads are switched off in a first step when the battery voltage drops. An acoustic alarm warns of the impending switch-off. Switching back on is done automatically at 12.5/25V.

With the setting "13V" an **energy management** can be realized, e.g. an additional cool box, a heating carpet or a hot water boiler can be activated as soon as the alternator is running or a solar panel produces enough energy. With the remote control panel FB-TSA the two outputs can be remotely switched and in case of emergency they can be switched on again for a short period of time.

TSD 40 — Item-No.: **0 8000 1240**

Rated voltage	12 / 24 V DC, adjustable via DIP switches
Current capacity	each channel (2) max. 40 A
Switch off voltage Rel.1*	adjustable via DIP switches: 11.8 / 12.0 / 12.2 / 13 V @300 s
Switch off voltage Rel.2*	adjustable via DIP switches: 10.8 / 11.2 V @50 s
Switch on voltage*	12.5 V
Consumption	1.3 mA / 12 V, 2 mA / 24 V
Connection	Screw terminals, max. 10 mm²
Dimensions	L 130 x W 80 x H 42 mm

* for 24V: double voltage values!



The remotely controllable battery main switch TSA 265 is suitable for disconnecting the complete on-board electrical system or inverters. The optical pre-warning on the control panel FAR signals an imminent emergency shutdown when the lower voltage limit is reached. The on-board power supply can also be switched on and off remotely. Re-switching is done automatically at 12.5/25V. The very low power consumption does not represent an additional load for the battery to be protected. With the help of the control interface TSR the remotely controllable battery main switch FBR 500 (500A cont. power) can also be used as deep discharge protection. Manual emergency operation at the relay is possible.

Type	TSR 12 V	TSR 24 V	THR 265 -12V	THR 265 -24 V
Item-No.:	0 8301 0100	0 8302 0100	0 8301 2675	0 8302 2675
Rated voltage	12 V DC	24 V DC	12V DC	24V DC
Current capacity	via FBR 500	via FBR 500	260 A	260 A
Switch off voltage	11.2 V / 22.4 V @300 s			
Switch on voltage	12.5 V / 25 V			
Overvoltage switch off	15.6 V / 31.2 V @60 s			
Consumption	1.3 mA	2 mA	1.3 mA	2 mA
Dimensions	L 120 x W 110 x H 50 mm		L 124 x W 95 x H 50 mm	

Remote control panel with switch and control - LED. The LED shows the operation status of the main switch and warns by a flashing display before an oncoming switch off.

FB-TSD — Item-No.: **0 8000 9126**

Remote control panel for TSD 12/40.
Dimensions W 105 x H 52,5 x D 40 mm

FAR — Item-No.: **0 8000 9127**

Remote control panel for TSA265, FBR265, TSR
Dimensions W 105 x H 52,5 x D 40 mm