

# VOTRONIC

## Installation and operating instructions

### D+ Simulator

No. 3066

The VOTRONIC D+Simulator is used to register the charging mode in a 12 V vehicle electrical system.

If additional consumer units are only supposed to be switched on if the alternator supplies power when the engine is running or if the vehicle battery is supposed to be charged using a cut-off relay at the same time by interconnecting the vehicle and starter battery, the D+ contact on the alternator is used to determine the charging mode of an alternator.

If this is not accessible or not present on newer alternators, the VOTRONIC D+Simulator generates this signal by monitoring the starter battery connected to the alternator.

**Note:** The device is not suitable for use in Euro-6 vehicles, as the alternator management system does not allow a connection from the starter battery voltage to a running engine or one at a standstill.



**Please read these installation and operating instructions before starting with the connection and start-up process.**

The VOTRONIC D+Simulator is fully automatic, maintenance-free and offers the following functions:

- **Switch output:** Possible to connect a power relay with a maximum holding current of 1.0 A (+ switching, overload-protected and short-circuit proof)
- **Switching delay approx. 4 seconds to prevent faulty activations due to voltage drops**
- **In case of a tendency to oscillate, automatic extension of the switch-off delay up to 90 seconds**
- **Display when D+ 'On' via LED**
- **Low intrinsic consumption**

The charging mode is detected by means of an intelligent voltage analysis of the battery connected to the alternator. It is therefore possible to activate a downstream battery cut-off relay to charge the vehicle battery whilst the engine is running.

Other application options arise when it comes to controlling additional consumer units that should only be activated when the battery is sufficiently charged. For example, switching on an air conditioning unit when driving or activating fans for interior ventilation.

The continuously illuminated LED (light-emitting diode) indicates that the control output is switched on. It is therefore possible to monitor the recharging of the starter battery. By connecting the switch output to a display (small 12 V light), the D+Simulator can also be used for monitoring charging remotely.

### Installation:

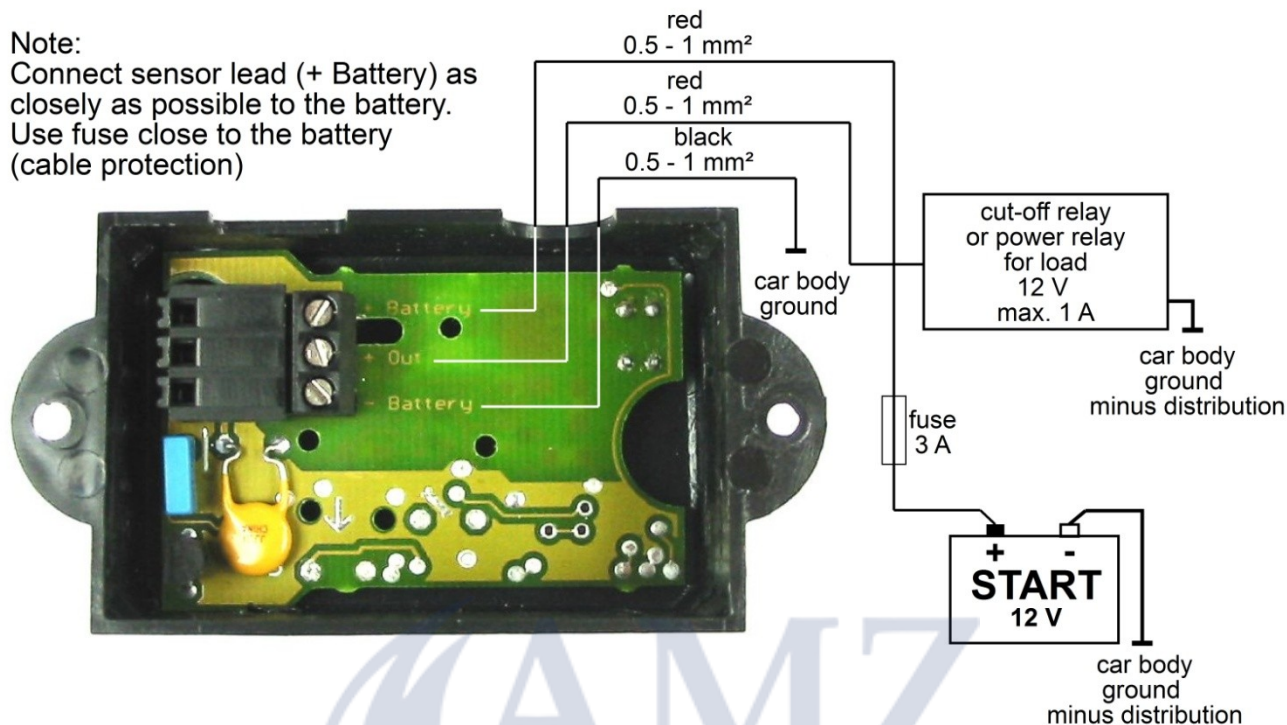
- The VOTRONIC D+Simulator can be fastened to any place protected against moisture.
- Any installation location.
- Fit the casing cover before final installation of the device.
- It is possible to feed the cable both at the side on the bottom edge of the casing and at the bottom of the casing (not visible).

## Connection:

- The three-pin plug-in screw terminal can be removed to facilitate the connection.
- The VOTRONIC D+Simulator must be able to measure the starter battery voltage as accurately as possible. Wherever possible, therefore, feed separate cables (+/-) directly from the battery to the device or choose cables that are only subjected to very small loads from other consumer units to prevent malfunctions.
- The rest of the casing interior can be used for surplus connection cable.

### Note:

Connect sensor lead (+ Battery) as closely as possible to the battery.  
Use fuse close to the battery  
(cable protection)



If a consumer unit with a power consumption of more than 1.0 A is required on the switch output, then this can be switched by means of an interconnected relay.

## Start-up:

After connecting the battery:

1. the 'Power' LED lights up briefly (on indicator)
2. the switch output is activated briefly (test)

## Function:

### Switch output activation:

If the battery voltage exceeds 13.7 V while charging, the switch output is activated after four seconds.

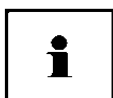
### Switch-off:

If the battery voltage drops below 13.0 V after the end of the charging process, the switch output is switched off after four seconds.

### Oscillation suppression:

If the battery voltage repeatedly drops quickly by activating a large consumer unit, the VOTRONIC D+Simulator extends the switch-off time to up to 90 seconds. This prevents the consumer unit from switching on and off quickly (oscillating).

If the battery voltage continues to drop to below 12.3 V during these 90 seconds, the switch output is switched off after four seconds nevertheless.



If the battery is charged not only by the alternator but also by other charging sources (> 13.7 V), then the control output may switch on accidentally. This can be prevented by an additional relay, controlled by Terminal 15 (ignition on). For this purpose, the D+ switch output ('Out') is connected in series with the make contact on this relay. **Do not** switch the supply voltage for the D+ Simulator ('+ Battery')!

## Operating displays:

'Power':	Flashing:	switch output switched off	(D+ signal off), ready to operate
	Illuminated:	switch output activated	(D+ signal on)

Further operation of the device is not necessary in normal automatic mode.



### Safety guidelines:

#### Application as intended:

The VOTRONIC D+Simulator has been designed on the basis of the applicable safety guidelines.

#### The device may only be used:

1. **With the specified fuses near the battery to protect the cabling and the device.**
2. **In perfect technical condition.**
3. **In a well-ventilated area, protected from rain, moisture, dust and aggressive battery gases as well as in a non-condensing environment.**

#### The device must never be used in places where there is a risk of a gas or dust explosion!

- Do not operate the device in the open air.
- Lay cables so as to prevent damage. Make sure they are well fastened.
- Never lay 12 V (24 V) cables with 230 V mains leads together in the same cable duct (empty conduit).
- Regularly examine live cables and leads for insulation defects, fractures or loosened connections. Rectify any defects that occur immediately.
- During electrical welding and work on the electrical system, the device must be disconnected from all connections.
- If, from the descriptions provided, it is not obvious to the non-professional user which specific values apply to a device or which regulations must be complied with, a specialist must be consulted.
- The user/buyer is responsible for complying with all types of construction and safety regulations.
- **The device contains no parts that can be replaced by the user.**
- Keep children away from batteries and connections.
- Observe the battery manufacturer's safety regulations.
- Ventilate the battery compartment.
- Non-observance may result in personal injury and material damage.
- The warranty is 36 months from the date of purchase (on presentation of the till receipt or invoice).
- The warranty is void if the device is used for unintended purposes, if it is operated outside the technical specifications, in case of improper use or external intervention. No liability is assumed for damages resulting from this. The exclusion of liability extends to any services carried out by third parties that were not ordered by us in writing. Services are to be exclusively carried out by VOTRONIC Lauterbach.



#### Declaration of Conformity:

In accordance with the provisions of Directives 2014/35/EU, 2014/30/EU, 2009/19/EC, this product complies with the following standards or normative documents:

EN55014-1; EN55022 B; EN61000-6-1; EN61000-4-2; EN61000-4-3; EN61000-4-4; EN62368-1; EN50498.



The product must not be disposed of in the household waste.



The product is RoHS compliant. It complies with the directive 2015/863/EU for Reduction of Hazardous Substances in electrical and electronic equipment.

**Quality Management System**

**DIN EN ISO 9001**

**Technical data:**

**VOTRONIC D+ Simulator**

System voltage DC: 12 V lead acid/gel/AGM (voltage range 8-32 V)  
Intrinsic current consumption at rest: < 0.001 A  
Intrinsic current consumption when output active: < 0.007 A

Alarm output (out): Positive potential, + switching, PNP output  
Max. power rating: 1.0 A, internal fuse, self-resetting

Switching threshold, control output:  
13.65 ... 13.85 V on  
12.85 ... 13.05 V off

Switching delay on: 4 seconds

Switching delay off: 4 seconds,  
up to 90 seconds in case of tendency to oscillate,  
< 12.3 V always 4 seconds

Operating voltage and control output connection: 3× plug-in terminal screw 1 mm<sup>2</sup>  
Device installation location: any  
Working temperature range: -20 ... +50°C  
Protection class: IP21  
Dimensions: 55 × 36 × 17 mm  
Weight: 30 g  
Ambient conditions, humidity: max. 95% relative humidity, non-condensing

**Scope of delivery:**

- VOTRONIC D+ Simulator
- Operating instructions

Subject to misprints, errors and technical modification without notice.

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**Drilling template:**

**Upper edge of device**

