VOTRONIC

Installation and operating instructions

D+ Simulator Pro No. 3067

The VOTRONIC D+ Simulator Pro (hereinafter referred to as D+ Simulator) is used to simulate a D+ signal on vehicles with a combustion engine, e.g. motorhomes or special vehicles.

If consumer units are only supposed to be operated with the engine running or the vehicle and starter battery classically interconnected for charging purposes, the D+ signal on the alternator is used to activate this.

If this is not accessible or not present on newer alternators, the VOTRONIC D+ Simulator generates this signal by detecting the vibration from the running engine.

It works independently from the alternator's charging mode and is therefore **particularly suitable for vehicles** that have an alternator management system, which may be, for example, **Euro-6-vehicles**.

With its low power consumption of less than 3mA, it meets the requirements of DIN EN 13976.

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

- **Switch output:** max. 0.3 A (+ switching, overload-protected and short-circuit proof)
- **Switch-on delay approx. 4 seconds to prevent faulty activations**
- **Adjustable, additional voltage monitoring**
- **Adjustable switch-off delay**
- **Device status displayed on three-colour LED**
- **Low intrinsic consumption**
- **Suitable for 12 V and 24 V systems.**

The D+ Simulator is not designed to operate safety-relevant components or devices!
Observe the safety regulations!

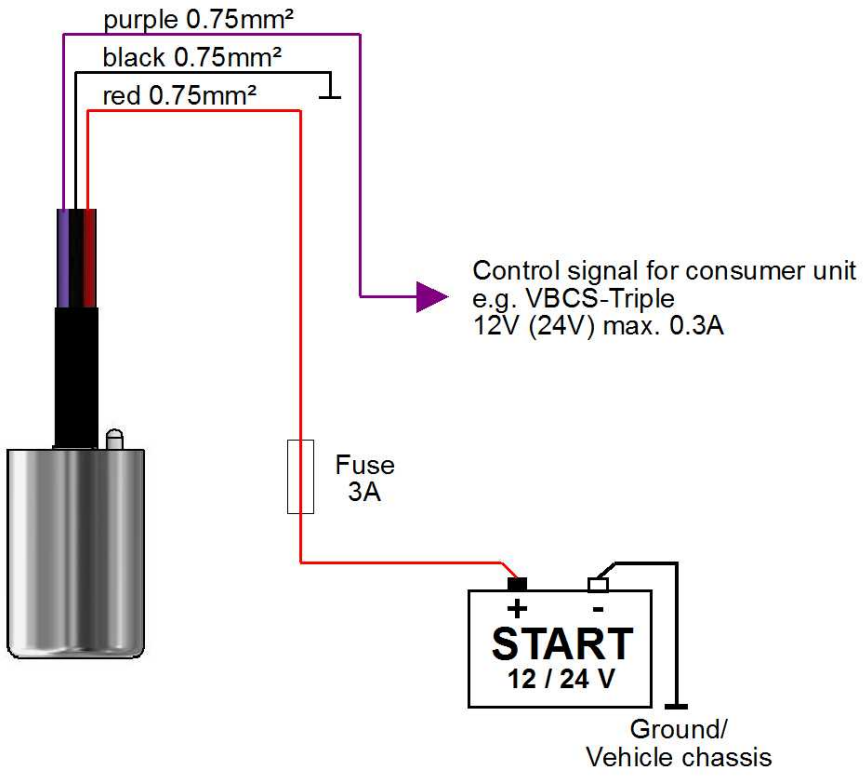
Please fully read these installation and operating instructions before starting with the connection and start-up process.

Installation:

- Fasten the D+ Simulator to a suitable place on the engine using a clip.
- The function of the engine must not be impaired by the installation.
- The vehicle manufacturer's specifications must be observed.
- Any installation location can be selected.
- Attach the clip on the bottom third (opposite the connection side) of the device.
- Check the device is mechanically secured!
- Lay cables so that they cannot touch any parts with temperatures over 100°C.
- Fasten cables without any tensile forces.
- Fasten cables so that they remain capable of moving on the sensor (mechanical stress).

Connection:

- Wire the device according to connection diagram.

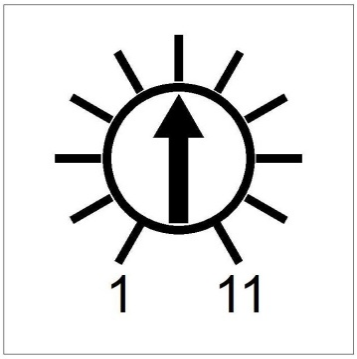


Note:
The device can be operated either on the starter battery, vehicle battery, Terminal 15 or switch outputs.
The additional voltage detection may need deactivating, see corresponding chapter.

Start-up and operation:

After applying the operating voltage, the D+ Simulator automatically determines its operating voltage range (12 V/24 V). Whilst doing so, the LED flashes red and green alternately.
The device is then in standby (LED flashed red) and is now ready to operate.

Depending on the position, various switch-off delays or functions can be set with the trimmer.



Position	Function/ Switch-off delay
1	Setup
3	10 s
4	15 s
5	30 s
6	60 s
7	90 s
8	2 min
9	3.5 min
10	5 min

Setting the switch-off delay:

To set the required switch-off delay, set the trimmer to the corresponding position.
The switch-off delay specifies how long the D+ signal is maintained after switching the engine off.
If the switch-off delay is selected appropriately, the D+ signal can be prevented from being unintentionally switched off on vehicles with an automatic start-stop system.

Setting the voltage detection:

To be able to set the additional voltage detection, the trimmer must be put into the “Setup” position.
If the device is in setup, the LED flashes yellow.
To then switch the voltage detection off or back on, the trimmer must be turned quickly 3 x from the leftmost to rightmost position and back again.
If this is successful, the LED flashes red 3 x (voltage detection switched off) or green 3 x (voltage detection switched on).
Once the voltage detection has been set, set the trimmer to the required switch-off delay: setup mode will then automatically be exited.
When the voltage detection is active, the D+ signal will only be switched on when there is a voltage of 13.7 V (or 27.4 V) for min. 4 s. The device is therefore then controlled by vibration and voltage. After switching on the D+ signal, the voltage may drop back below this threshold (alternator management). The D+ Simulator is then controlled purely by vibration again.
If the device is supplied by the vehicle battery, Terminal 15 or other voltage sources, it is recommended to disable the voltage detection, as these voltages are often smaller than the voltage of the charging alternator.

Operating displays:

The operating status is shown by different flashing cycles of the LED.

LED	Operating status	Information
Flashing red	Standby, D+ off	
Flashing green	Active, D+ on	
Flashing yellow	Setup	
Flashes 3 x red	Voltage detection switched off	[1]
Flashes 3 x green	Voltage detection switched on	[1]
Flashing red/green alternately	Sensor determining voltage range	[2]

[1] Only direct after deactivating or activating the voltage detection.
[2] Only when first connecting or reconnecting to the supply voltage, as well as active voltage detection.

No further operation is necessary.

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.**

- **The device must not be used to operate safety-relevant components or devices!**
- 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.
- Regularly check the attachment.
- 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.

Technical data:	**D+ Simulator Pro**
System voltage DC:	12 V / 24 V (voltage range 10 - 32 V)
Intrinsic current consumption at rest:	< 0.003 A
Intrinsic current consumption when output active:	< 0.007 A
Switch output:	Positive potential, + switching, PNP output
Max. power rating	0.3 A, internal fuse, self-resetting
Switch output switching threshold: (additional voltage detection)	13.65 … 13.85 V / 27.3 … 27.7 V
Switching delay on:	4 seconds
Switching delay off:	10 s…5 min, adjustable
Operating voltage and control output connection:	3 x connection lead 0.75mm², 2 m long, permanently installed
Device installation location:	any
Working temperature range:	-40 … +105° C
Protection class:	IP64
Dimensions (without connection leads):	43 x 25 mm, cylindrical
Weight:	100 g

Notes:

Declaration of conformity:
Pursuant to the provisions of directives 2014/35/EU, 2014/30/EU, 2009/19/EG this product corresponds to 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 household waste.

The product is RoHS-compliant. It therefore meets Directive 2015/863/EU for restricting hazardous substances in electrical and electronic devices.

Qualitäts-Management
produziert nach
DIN EN ISO 9001

Notes:

Scope of delivery:
- D+ Simulator Pro
- Fastening clip

Made in Germany by
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