

## Tank protection STG 1



### STG 1 incl. base module STG 3/6 check fuses, IP 67 for individual outdoor installation

The tank protection STG 1 prevents diesel theft from lorries and construction machinery. The level of the fuel tank is permanently monitored when the ignition is switched off.

When the level falls below an automatically determined reference value, an alarm is forwarded to the signal equipment horn / GSM / telematics

The tank protection is activated when the vehicle ignition is switched off, and measures the fuel level of the vehicle tanks at a fixed time interval after a standby period (STG 6: normal measurement function; STG 3: inverted measurement function).

Switching from STG 3 to STG 6 takes place by jumper inside the STG 1 at terminal strip X3. A declining tank level triggers an alarm (horn: 30 sec. interval [statutory maximum period], GSM/telematics control: 10 sec). Switching output terminal X8 may be used to drive commercially available 12/24 V signal equipment at up to 5 A. Check fuse, relay, and cable glands are included for simple and quick installation.

### Characteristics

- Easy installation and also outdoors eg battery box, vehicle frame
- For vehicles with 12/24 V on-board voltage
- Ideal for trucks, construction machinery and other mobile and stationary diesel-powered equipment
- Clocked alarm output for vehicle horn, 30 sec.
- Automatic arming when ignition OFF
- Convenient connection via spring-loaded terminals
- Vibration-proof cast
- Incl. relay, fuses and fittings
- Easy dismantling when changing vehicles

### Scope of supply

- Tank protection STG 1
- User information

### Electrical connection

The connection of the tank protection is to take place according to the table below. Please also refer to the wiring diagram. The connections between the terminals X7 and X9 are only used in conjunction with an integrated GSM/GPS module (STG 2).

### Technical data STG 1 incl. base module

Control voltage	7..30 VDC
Standby current	< 5 mA
Fuse STG3/6	F2 max. 2 A
Tank sensor resistance	0..1 kΩ
Output current (horn, light)	F1 max. 5 A (ground connected)
ESD surge protection	
Inputs/Outputs	8 kV according to IEC61000-4-2
Operating ambient	-25..+60 °C IEC 60068-2-1/2
Conductor cross-section	0.5..1.5 mm <sup>2</sup> (stranded)
Stripping dimension	10 mm
Protection class	IP20 (EN 60529)
Shock resistance	min. 100 m/s <sup>2</sup> (10 G)
Vibration resistance	min. 40 m/s <sup>2</sup> (4 G) @ 10 Hz to 100
Humidity (relative)	5..95% (no condensation)
Weight	240 g
Dimensions (LxWxH)	150 x 80 x 70 mm

### Assembly

Note the environmental conditions and cable cross-sections specified in the technical data.

### Measurement response

Optional customised programming.

### Approval

Kraftfahrt-Bundesamt approval number (E) 036319  
European Patent Application No. 12171559.3

### Safety and liability notes

Before all works, ensure that no voltage is present by disconnecting the vehicle battery.

Short circuits may cause fires, explosions and severe burns!

Guarantee and warranty claims are rendered void by improper use, misuse or modification of the product.

**Connection works must be performed by trained staff only.**

## Connector X1 (10-pin)

Pin	Function
1.1	+7..30 VDC, battery, terminal 30 (fuse max. 2 A)
1.2	+7..30 VDC, ignition, terminal 15
1.3	Ground, terminal 31
1.4	free
1.5	Fuel gauge (- minus)
1.6	Tank sensor (- minus)
1.7	Fuel gauge (+ plus)
1.8	Tank sensor (+ plus)
1.9	Alarm output 1 A GSM (ground connected) 10 sec.
1.10	Alarm output horn, clocked (ground connected) 30 sec.

## Terminal block X4 (2-pin)

Pin	Function
4.1	Fuel gauge (- minus)
4.2	Fuel gauge (+ plus)

## Terminal block X5 (2-pin)

Pin	Function
5.1	Tank sensor (- minus)
5.2	Tank sensor (+ plus)

## Terminal block X6 (4-pin)

Pin	Function
6.1	Supply STG 1 term. 30 (+ plus)
6.2	Supply STG 1 term. 31 (- minus)
6.3	Supply STG 1 term. 15 (ignition on/off)
6.4	Output signal for GSM control, ground connected e.g. vehicle telematics

## Terminal block X7 (4-pin)

Pin	Function
7.1	Supply (+ plus) term. 30 GSM / telematics
7.2	Supply (- minus) term. 31 GSM / telematics
7.3	Control relay from GSM / telematics, ground
7.4	GSM alarm input

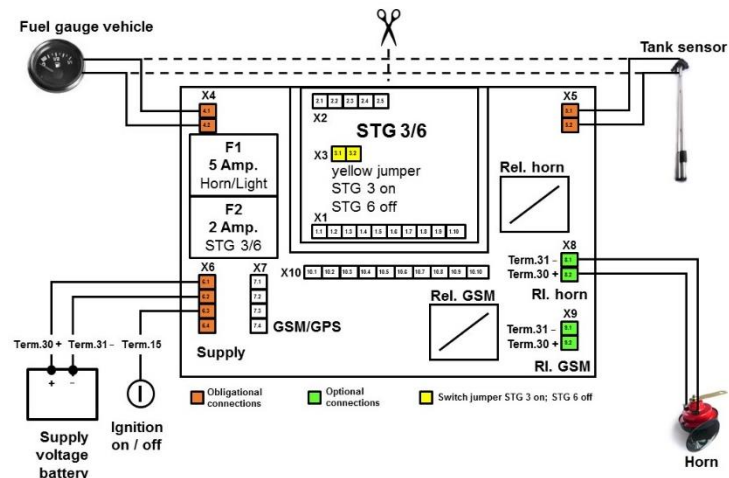
## Terminal block X8 (2-pin), 30 seconds clocked

Pin	Function
8.1	Horn signal (- minus) term. 31, max. 5 A
8.2	Horn signal (+ plus) term. 30, max. 5 A

## Instructions

- The tank protection STG 1 come with with all required fuses and relays for easy and quick installation. At terminal strip X6, the corresponding supply lines (term. 30+, term. 31 ground and term. 15 ignition) are connected via terminals 6.1, 6.2 and 6.3. At terminal 6.4, a GSM alarm signal is transmitted to the corresponding telematics (GSM alarm module, GPS positioning by external tracking devices)
- The horn signal is generally connected via terminal X8. An integrated GSM module may also be optionally used to generate a silent alarm.
- STG 1 module with reverse polarity protection up to 5 A
- Note the operating voltage of 9 to max. 30 volts.

## Wiring plan STG 1



- Cable cross-sections for plug-in terminals up to 1.5 mm<sup>2</sup>.
- Only perform resistance measurements on the equipment when no voltage present.
- Measurement values at X5 (term. 5.1 and 5.2) must be equal to the ohm values for the level sensor in the tank.
- Fuel sensor lines via CAN-BUS must be distributed to terminal block X4 (term. 4.1 and 4.2) and the terminal block X5 (term. 5.1 and 5.2), and connected according to the wiring diagram.

## Defaults settings STG 1

- First reference measurement after approx. 130 seconds. A pre-alarm may take place after another 25 second delay, followed by the main alarm.
- Green LED measurement function
- Red LED alarm trigger
- One message per alarm trigger
- Repeat alarm for further drop in level after approx. 60 seconds.
- Complete reset when ignition is switched on.

## Guideline values for alarm trigger

### for the following tank sizes

- <300 l tank, trigger approx. after 5-12 l
- 300-400 l tank, trigger approx. after 10-18 l
- 400-600 l tank, trigger approx. after 15-25 l
- 600-800 l tank, trigger approx. after 22-30 l
- >800 l tank, trigger approx. after 25-40 l

For higher accuracy levels, use of a separate and independent tank sensor is recommended, which we supply adjusted to less than 20 litres for larger tank volumes.

Note that the thermal expansion for diesel fuels is equal to approx. 1% per 10°C. For example: In an 800 litre tank, the expansion is equal to approx. 15-18 litres at a temperature variation of +/- 20 °C.

