VOTRONIC

Installation and Operating Manual

Fresh Water Tank Display S	12 V and 24 V	**Order No. 5311**
Sewage Water Tank Display S	12 V and 24 V	**Order No. 5313**
Feces Tank Display S	12 V and 24 V	**Order No. 5315**

The VOTRONIC tank displays had been designed for precise remote level measuring of supply and waste tanks in mobile homes, caravans and boats. They are suitable for any tank material and tank size.

Please read the mounting instructions and operating manual including the safety regulations completely prior to starting connection and start-up.

The tank level is represented in form of a clearly arranged luminous bar with 10 light-emitting diodes in three colours allowing that the tank level can be read conveniently at a glance. Display is effected continuously; intermediate values are displayed with variable brightness.

During refuelling and defuelling of the tanks, the continuously raising or dropping display shows a direct image of the instantaneous level.

The fresh water tank display warns in time of an empty water tank. Due to its accuracy it is a very good aid for tank filling. Also the sewage water and the feces tank display facilitate immediate disposal, which is appreciated by environment-conscious users.

The tank displays can be used as individual units, as well as with other VOTRONIC panels. The combination with units of the VOTORNIC modular system, such as the battery display Duo Storage Battery Tester S, the LCD Displays S, as well as the Switch Panels S and Fuse Panels S, is a useful application. The appearance of all units is identical, and they can be easily connected.

Installation:

Choose a well visible and easily accessible location in the living area for installation of the units. The installation place in the front panel of the furniture should be chosen in such a way that the contrast of the display be not hindered (sun light).

The small mounting depth of only 14 mm of the electronic system allows flush mounting into commercial furniture boards to ensure, that an optimum installation place can always be chosen without losing precious storage space.

The clear opening of the furniture cutout should be slightly larger than the assembly dimensions of 29 x 62 mm to ensure safe alignment of the unit's front panel.

TIP If several VOTRONIC units are applied, use the delivered jig for marking. The drilling jig facilitates positioning and reduces the expenditure of installation, since time-consuming measuring for alignment is not required.

The rear cutout opening should be covered with electrically nonconducting material (e. g. plastic plate, poplar plywood, or similar material) to ensure full utilization of the storage space, which might be located behind. Make all electric connections, place the unit centrically in the cutout and use the delivered screws for fastening.

Level measurement requires installation of a tank transmitter (measuring sensor) at each tank, which must be connected to the tank display via three cables or two cables (as well as ground/battery minus).

Required Measuring Sensors (1 each Tank) for 12 V and 24 V Tank Displays
Selection acc. to Tank volume, tank height and installation possibility at the tank:

Tank Transmitter, Measuring Sensor Type	Order No.	Installation at the Tank	Adjustable Tank Height in cm		Tank Material Pl = Plastic Me = Metal	Tank Volume		
Tank Electrode 12-24 K	5543	Top/Bottom	12	24	Pl / Me	•	•	•
Tank Electrode 15-50 K	5545	Top/Bottom	15	50	Pl / Me	•	•	•
Tank Electrode 20 K-WC	5555	Top	12	24	Pl / Me	--	•	•
Tank Electrode 50*	5542	Top/Bottom	20	50	Pl / Me	•	•	--
Tank Electrode 30-110 K-FL	5551	Top	30	110	Pl / Me	•	•	--
Tank Sensor FL	5530	Lateral Side/Top	30	100	Pl / Me	•	•	--

* Article is well suited, but no longer in the current delivery program, substitutional for several types

Note: All measuring sensors listed in the table supply a continuous signal and are designed for continuous operation. Thus, their design is optimally adapted to an operation at the tank displays.

Former measuring sensors, such as the tank transmitter set, order No. 5510, and the tank probe, order No. 5520, work according to the conductive measuring method (conductivity). Due to the 7-stage measurement, they are no longer suitable for continuous operation at the tank displays S.

Connection Plan:

Configuration of Connections:

1 = Board Battery "-" (Minus) or Body Ground
2 = Board Battery "+" (Plus)
4 = Tank Signal (Measuring signal, of the tank transmitter)
5 = Tank + (Plus, switched, to the tank transmitter)

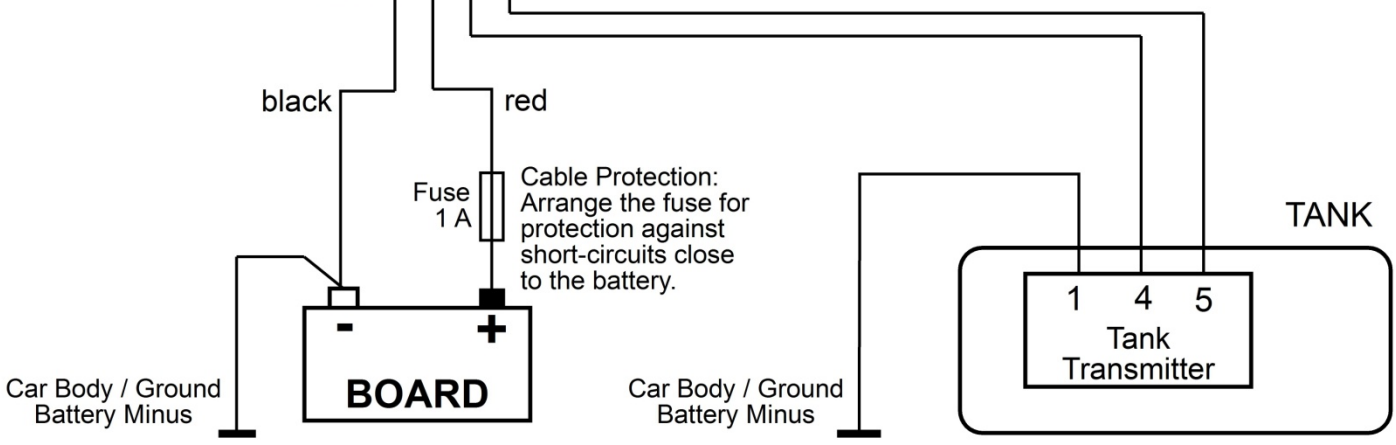
Recommended Cable Cross-Sections:

0.5 - 1.5 mm²

Easy installation of the unit is ensured by short cables. Connection prior to the final installation.

Carefully screw down stripped cables with all single wires to the terminal observing that no single wires jut out laterally.

The units are equipped with an electronic protection against reverse battery by mistake (+ and - are mixed up) as well as overload / short-circuits.



Operation:

If the key is pressed, the display bar runs to 100 % for a short time for reasons of testing.

- After that the instantaneous level of the tank will be displayed.
- If they key is pressed again, the display is switched-off.
- In case of an empty tank, the lowest LED is always lighting dimly at least brightness.
- 10 minutes after the last activity, the display will be switched-off automatically for reasons of power saving.
- Activation of the tank transmitter is effected together with the display.

Tips:

2 Tanks at one display:

It is also possible to assign 2 tanks to the individual display units for selective measuring, such as inside/outside tank, summer/winter operation, auxiliary tank etc.

For switching, separate switches 2xUM with push-on connection are suitable, such as:
Switch Panel 16 A S Order No. 1289

Switch Panel 2x16 A S Order No. 1291

With the double selector switches the cables

4 = Tank signal (measuring signal) and

5 = Tank + (Plus)

can be switched selectively to either of the tank measuring sensors.

The cables 1 = Board Battery "-" (Minus) or Body Ground remain always connected.

Marking of the terminals:

Amongst others, the connections of the panel are marked with numbers. The numbering of all VOTRONIC display units has been assigned systematically to the corresponding connections. Thus, connection of several units is facilitated.

The cables in different colours help to avoid malfunctions due to mixed up connections.

Miscellaneous:

If the connection is obviously correct and malfunctions are suspected, please check the following:

Possible causes, if the displayed value is permanently < 10 %:

a. Cable 5 = Tank +, switched, to the tank transmitters, 12 V / 24 V: Interrupted or short-circuited → Check
b. Cable 4 = Measuring signal of the tank transmitter: Short-circuited to ground → Check

Possible causes, if the displayed value is permanently 100 %:

a. Cable 1 = Board Battery "-" or Body ground to the tank: Interrupted → Check
b. Cable 4 = Measuring signal of the tank transmitter: Short-circuited to plus → Check

Performance Test Display: Release terminal 4 = measuring signal of the tank transmitter and connect terminal 4 (for reasons of testing) to:

a. Terminal 1 = Board Battery "-" or Body ground → Display must drop to 3 %
b. Terminal 5 = Tank +, switched → The display should increase to 100 %

Then, the display function is basically correct, and the cause has to be searched with regard to the tank transmitter.

Safety Regulations and Appropriate Application:

The tank displays have been designed according to the valid safety regulations.
Appropriate application is restricted to:

1. **Fused battery direct voltage with nominal voltage 12 V or 24 V.**
2. **Technically faultless condition.**
3. **Installation in a well-ventilated room, protected from rain, humidity, dust, aggressive battery gas, as well as in an environment being free from condensation water.**
4. **With a rear insulating cover of the display unit.**

- Never use the unit at locations where the risk of gas or dust explosion exists!
- Cables are always to be laid in such a way that damage is excluded. Observe to fasten them tightly.Never lay 12 V (24 V) cables and 230 V mains supply cables into the same cable conduit (empty conduit).
- Check live cables or leads periodically for insulation faults, points of break or loosened connections. Occurring defects must be remedied immediately.
- **Always disconnect the power supply to the battery prior to working on the electric system.**
- **The unit is to be disconnected from any connection prior to electrically welding.**
- If the user is not able to draw from the manual, which characteristic values are valid for a unit or which regulations are to be observed, a specialist is to be consulted.
- The user/buyer is obliged to observe any construction and safety regulations.
- **The unit is not equipped with parts, which can be replaced by the user.**
- **Never use solvents or aggressive household cleaners for cleaning of the display!**
- The warranty period is 36 months from the purchase date (against presentation of the sales slip or invoice).
- The warranty will be void in case of any inappropriate utilisation of the unit, if it is used beyond the technical specification, in case of improper operation or external intervention. We do not assume any liability for any damage resulting hereof. The liability exclusion is extended to any service being executed by third, which has not been ordered by us in writing. Service is to be effected exclusively 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 2011/65/EU for Reduction of Hazardous Substances in electrical and electronic equipment.

Quality Management System
DIN EN ISO 9001

Technical Data:

Operating Voltage:	12 V and 24 V DC Board Mains (10 V - 32 V)
Current Consumption:	1 mA (OFF) - max. 30 mA (Display 100 %)
Terminal “5” Tank +:	10 V - 32 V, max. 120 mA with internal electronic protection
Weight:	28 g
Dimensions:	85 x 47 x 17 mm
Assembly Dimensions/ Mounting Depth:	62 x 29 mm / 14 mm

Delivery Scope:
- 1 Pc. Display Unit
- 4 Pcs. Fastening Screws
- 1 Pc. Mounting Instructions and Operating Manual
- 1 Pc. Drilling Jig

If VOTRONIC units are used in combination with other products, faultless operation cannot be guaranteed!
Subject to misprints, errors and technical modification without notice.

Made in Germany by VOTRONIC Elektronik-Systeme GmbH, Johann-Friedrich-Diehm-Str. 10, 36341 LAUTERBACH/GERMANY
Phone: +49 (0)6641 / 91173-0 Fax: +49 (0)6641 / 91173-20 E-mail: info@votronic.de Internet: www.votronic.de