

VOTRONIC

Installation and Operating Manual

Tank Sensor FL

For Tank Height 30 cm - 100 cm, 12 V and 24 V

No. 5530

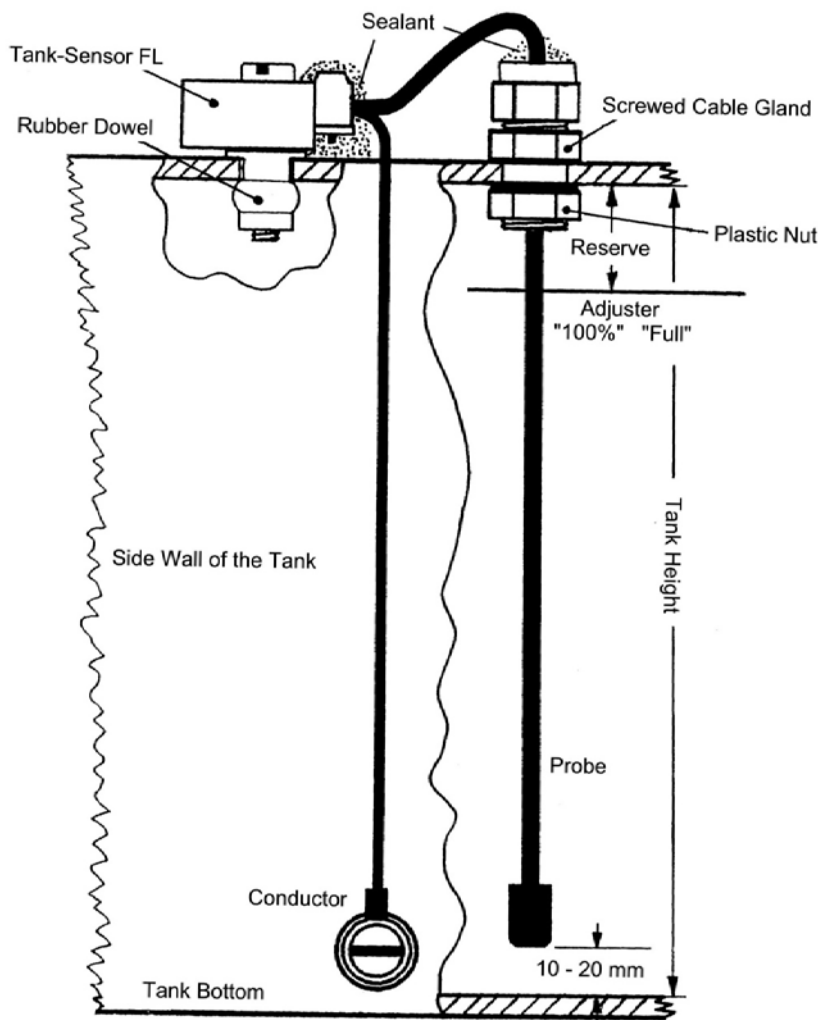
The tank transmitter had been designed for precise level measuring of fresh water tanks, sewage water tanks and feces tanks of plastic and metal material in campers, caravans and boats. Measurement of the level is effected fully-automatically without mechanically moving parts according to the capacitive method of measurement, and it is transferred to the display unit via a three-core cable. The electronic system is completely sealed. Suitable and required for the VOTRONIC Tank Displays:

Tank Display Units (silver design):	Order No 12 V	Order No 24 V
Fresh Water Tank Display S	5311	5311
Sewage Water Tank Display S	5313	5313
Info Panel Pro	5330	
Votronic Bus System VBS 2	all Types	all Types
Votronic VPC System	all Types	all Types
Previous Votronic tank displays since 1987	all Types	all Types

The Tank Sensor FL has to be mounted directly at the tank. It is suitable for:

- Fresh Water (if applicable, please observe the Guidelines for Drinking-Water Quality DIN 2001-2)
- Sewage Water
- Plastic Tanks, all materials
- Metal Tanks (Aluminium, Steel, Stainless Steel, etc.)
- It is adjustable to tank heights from 30 cm to 1 m.

Fig. 1: Installation on top of the tank (preferred)



The fill level in the tank is measured capacitively. This is because the probe forms with the surrounding water a "capacitor" whose value increases with the fill level measured by the Tank Sensor FL. The compound to the water as an "antipole" is formed by the "conductor".

It is important that the probe can hang freely and do not tangents the tank wall or installations in the tank.

Depending on the conditions of space, the Tank Sensor FL can be installed:

1. at the tank top (preferred, **Fig. 1**)
2. or laterally at the tank top (**Fig. 2**).

Fig. 2: Installation at the Lateral Top Side

Installation from the top, Fig. 1:

The bore hole \varnothing 12.5 mm for the probe should be placed at the topmost location and in the tank centre. The antikink device at the screwed cable gland is not required and can be cut off. Screwed cable gland has to be bolt together with sealing ring and counter nut.

Installation at the lateral top side, Fig. 2:

The bore hole \varnothing 12.05 mm for the probe should be placed **as high as possible** at the tank top. The antikink device is located at the tank. It ensures the required distance between probe and tank wall. Thus, indication errors due to formation of algae or soiling of probe and tank wall are avoided. Screwed cable gland has to be bolt together with sealing ring and counter nut.

Module mounting, Fig. 1 and 2:

Drill a second bore hole \varnothing 9.5 mm for the rubber dowel in the immediate vicinity of the bore for the probe. The rubber dowel is used to install the electronics module with the long stainless steel screw M5x30. It is important to ensure that the probe cable lays **shortest possible route** from the electronic module to the screwed cable gland of the probe (Fig. 2 and Fig. 4) to avoid errors.

Conductor mounting on the plastic tank, Fig. 1 and Fig. 2:

Set the hole \varnothing 9.5 mm for the conductor as **near as possible to the bottom of the plastic tank**. The drilling has to be burr. Rubber dowel with washer, cable lug and stainless steel screws M5x20 can be installed, Fig. 3

Conductor connection to the metal tank, Fig. 4:

Conductor screw and rubber dowel are not required for metal tanks. Instead, connect the cable lug electrically to the tank by means of a Parker screw near the electronic module.

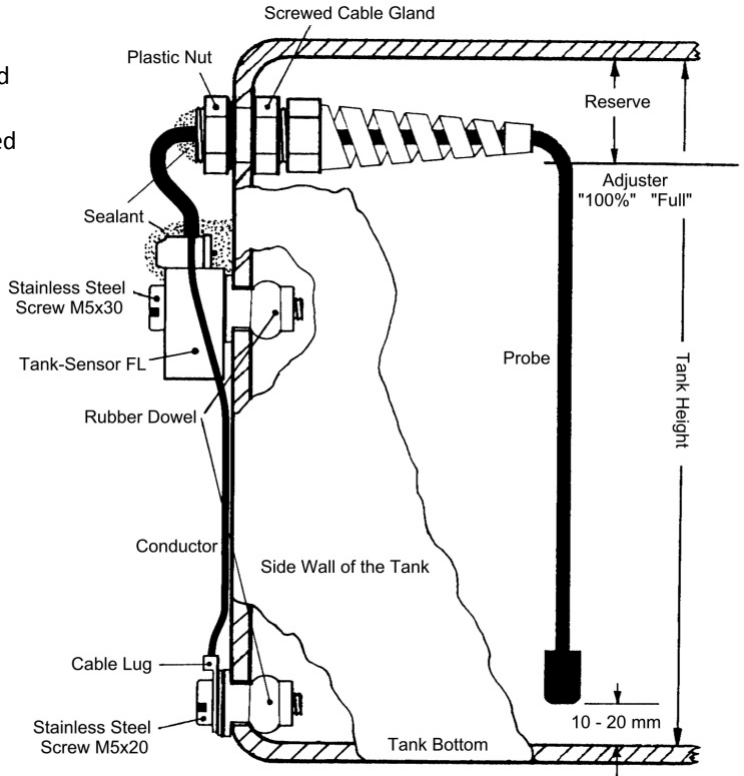


Fig. 3: Conductor with Plastic Tanks

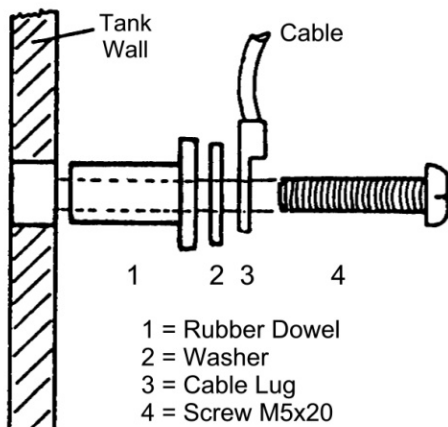
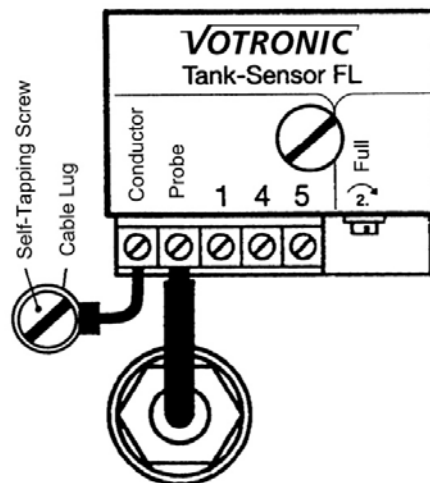


Fig. 4: Conductor with Metal Tanks



Probe Length:

Insert a screwed cable gland into the bore hole and pull up the probe until a clearance of **approx. 10-20 mm is left between the probe end and the tank bottom**. Thus, indication errors due to formation of sludge in sewage water and feces tanks is avoided. Tighten the screwed cable gland until the probe will be held perfectly, even in case of slight of tensile load.

Shorten excess of probe cable, neatly strip the insulation and screw down to the electronic module with the terminal "Probe".

Connection (q.v. Fig 5, Connection Plan):

Configuration of Connections Tank Probe:

- 1 = Battery "-" (Minus) or Body Ground (0.5 - 1.0 mm²)
- 4 = Tank Pulse to the Display Unit Connection 4 (0.5 - 1.0 mm²)
- 5 = Tank "+" to the Display Unit Connection 5 (0.5 - 1.0 mm²)
- A = Conductor Stainless Steel Screw at the Tank Bottom
- S = Probe measuring line, highly flexible, being suspended in the tank

The VOTRONIC Tank Sensor FL is completely protected against wrong polarization. It is, however, recommendable to use connection cables of different colours to avoid malfunctions due to mixed up connections.

Start-up and Adjustment:

A setting screw being located at the terminal side of the electronic module can be used for the adjustment "Full" to the conditions of the tank. The range of action of this setting screw is 25 rotations. It does not have a limit stop, so "overwinding" is excluded.

1. Fill the tank until the reserve level is reached (fig. 1 and fig. 2).
2. Turn the adjuster "Full" until "100 %" will be displayed on the display panel without problems.

The adjustment procedure is completed. The functions of the display can now be simulated with several water levels in the tank or by withdrawing the probe cable out of the full tank.

Final Installation:



In case of underfloor installation of the tank, the electric connections (terminal screws), the input of the probe screwing and the setting screw at the tank sensor FL have to be protected against environmental pollution by means of sealant. We recommend to also protecting the conductor (cable lug, stainless steel screw). Use a permanently elastic sealant (e. g. "Sikaflex") for protection.



Neither use silicone separating acetic acid in connection with metal, nor resisting agent containing carbon! The above-mentioned sealant has been proved to be very suitable in practice.

Tips & Tricks:

No reaction of display:

- a.) Cable "4 = Tank Pulse" withdraw connector by way of trial: The display should increase to "100 %".
- b.) Battery connection or fuse defective - check
- c.) Cable "5 = Tank Pulse" interrupted - check
- d.) Cable "4 = Tank Pulse": Short-circuit to ground - check
- e.) Conductor does not have any contact with liquid - check

Constant display of 100 % on the display unit:

- a.) Cable "4 = Tank Pulse" withdraw it and direct it to ground: No display
- b.) Cable "4 = Tank Pulse" interrupted – check
- c.) Cable "1 = Battery Minus/Ground" is interrupted or does not have any contact at the body sheet - check
- d.) Contact of the insulated probe with water (silicone cap leaky or dropped off, damaged insulation) – check

Indication Errors:

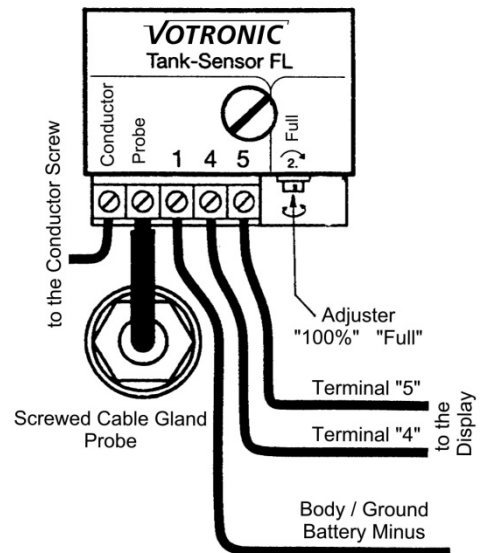
- a.) In case of underfloor installation of the tank and insufficient protection of the electric connections (humidity, soiling, de-icing salt) - clean and seal
- b.) Intense soiling and furring of the probe (formation of algae in the fresh water tank, "stuck" solids in the sewage water tank and feces tank) - clean tank



Declaration of Conformity:

In accordance with the provisions of the statutory requirements and the relevant directives, Electrical Equipment (Safety) Regulations 2016, Electromagnetic Compatibility Regulations 2016, The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 this product complies with the following standards or normative documents:

BS EN55014-1; BS EN61000-6-1; BS EN61000-4-2; BS EN61000-4-3; BS EN61000-4-4; BS EN62368-1; BS EN50498, BS EN IEC 63000.



Safety Regulations and Appropriate Application:

The VOTRONIC tank measuring sensor has been designed according to the valid safety regulations. Application is only allowed, if the unit is in technically faultless condition, in fixed installed 12 V / 24 V DC (direct current) systems / on-board power supply systems and only for the measurement of water or water-containing media.

- Never use the unit at locations where the risk of gas or dust explosion exists!
- The unit is to be disconnected from any connection prior to execution of electrically welding or work on the electric system.
- 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.
- If the non-commercial end-user is not able to recognize the characteristic values being valid for a unit or the regulations to be observed, a specialist is always to be consulted.
- The user/buyer is obliged to observe any construction and safety regulations.
- The manufacturer's warranty is 60 months from delivery.
- Improper use, operation outside the technical specifications, improper operation or third-party intervention will void the warranty or manufacturer's guarantee. No liability is accepted for any resulting damage. The exclusion of liability also extends to any services provided by third parties that were not commissioned by us in writing. Services exclusively provided by VOTRONIC Elektronik-Systeme GmbH, 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; 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



Recycling:

At the end of its useful life, you can send us this device for professional disposal:
You can find more information about this on our website at www.votronic.de/recycling

Technical Data:

Operating Voltage:	12 V-/24 V-DC Battery voltage (of the display)
Operating Voltage Range:	8...32 V
Current Consumption:	4...7 mA
Signal Output 0...100 %:	0...2.2 V,
Measuring Method:	capacitive, suitable for short-time and continuous operation
Tank Height, adjustable:	30...100 cm

Delivery Scope:

1 Tank Sensor FL Electronics Module	1 Conductor Cable, Length 1 m
1 Probe Cable	1 Stainless Steel Screw M5x30 (Sensor Fixing)
1 Screwed Cable Gland for Probe	1 Stainless Steel Screw M5x20 (Conductor)
1 Plastic Counternut for Screwed Cable Gland	1 Stainless Steel Washer (Conductor)
1 Packing Washer for Screwed Cable Gland	1 Installation and Operating Manual
2 Rubber Dowels	

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