

VOTRONIC

Installation and Operating Manual

Tank Electrode 30-110 K-FL Tank Height 30 - 110 cm, 12 V and 24 V **Order-No. 5551**

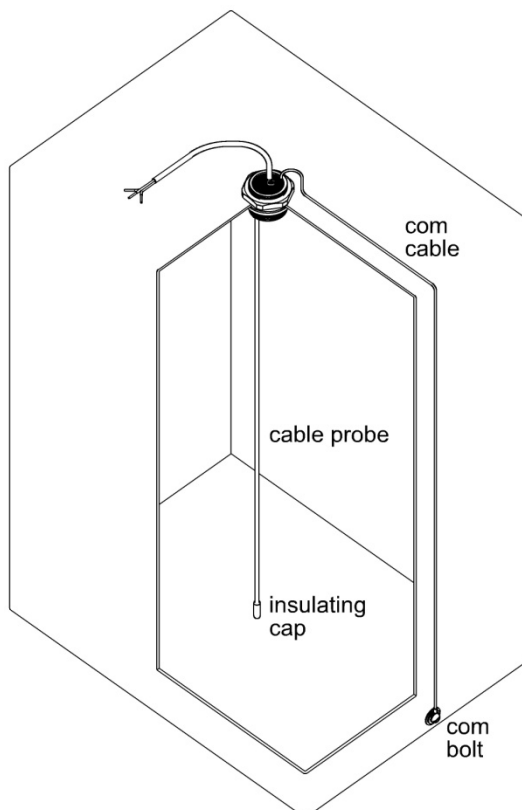
The tank transmitter had been designed for precise level measuring of fresh water tanks, grey water tanks and sewage water tanks of plastic and metal material in campers, caravans and boats.

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. Thus, it is extremely robust and insensitive to soiling.

Tank measuring sensor, suitable and required for VOTRONIC tank displays, 1 piece per tank:

Tank Display Units:	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	6330
• VOTRONIC VBS 2 BUS System	All Types	All Types
• VOTRONIC VPC System	All Types	All Types
• Previous VOTRONIC tank displays since 1987	All Types	All Types



For remote level measurement the **tank electrode K-FL** is installed directly at the tank. It is suitable for:

- Fresh water (No drinking water approval according to DIN 2001)
- Sewage water, grey water
- Plastic tanks, any material
- Metal tanks (aluminium, steel, stainless steel, etc.)
- Adjustable to tank heights from 30 cm to 110 cm.

Functioning:

The level in the tank is measured capacitively. The flexible cable probe and the surrounding water form a kind of "capacitor", the size of which is growing with the level, and which is measured by the electronic system.

The **contact to the water** as "antipole" is effected by a conductor, **connection "com"**.

Brief Instruction:

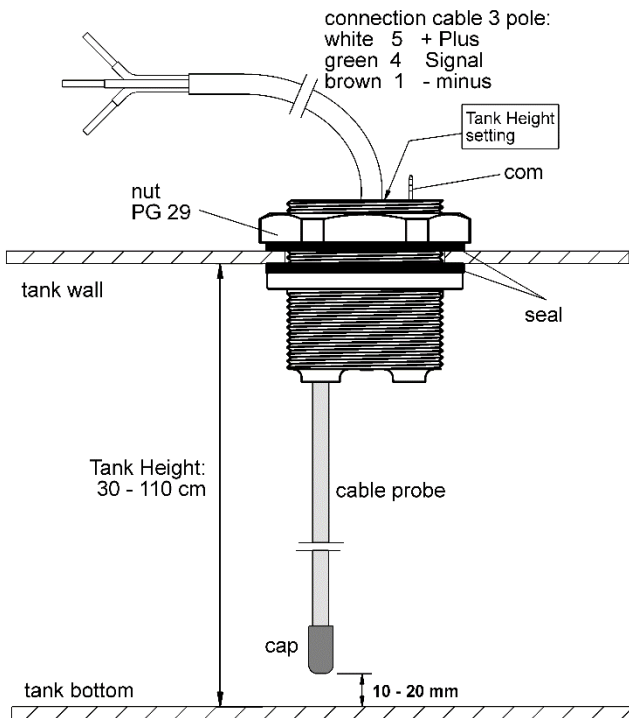
1. Produce a mounting hole at the tank with \varnothing 38 mm or thread PG 29
2. Determine the kind of installation, inside or outside the tank, and measure the inside tank height
3. Cut the cable probe to the desired length (observe a clearance of 10-20 mm between probe and tank bottom)
4. Reinsert the insulating cap on the cable probe (observe the tightness)
5. Install the tank transmitter inside or outside using the delivered packing washers
6. Conductor:
Plastic tank: Produce a bore hole, \varnothing 9.5 mm (as low as possible at the tank), burr, insert the conductor cable to the 2.8mm faston connector "com", cut it to length and crimp / solder it on the cable lug, insert the rubber dowel, install the washer and the cable lug by means of the stainless steel screw M5x20, tighten the screw.
Metal tank: Insert the conductor cable to the 2.8mm faston connector "com", and connect it conductively to the tank close to the transmitter.
7. Set the measured tank height at the scale.
8. Produce the electrical connection to the display unit.
9. Ready for start-up.

Preliminary Installation:

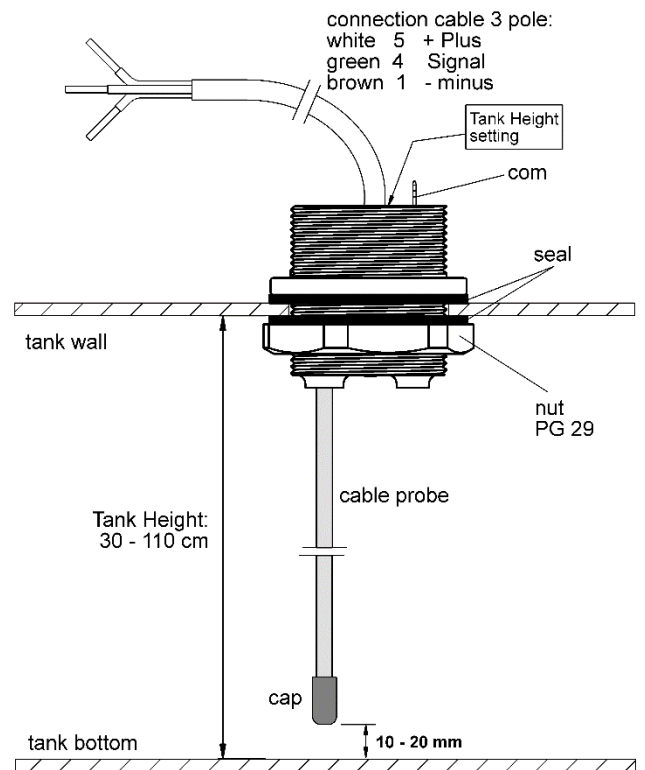
The tank electrode K-FL is designed for vertical installation from the tank top and should be placed at the topmost location and in the tank centre, mounting hole 38 mm diameter or thread PG 29.

Depending on the local conditions (available space above the tank, cutout of the intermediate floor, tank height etc.), the tank transmitter can be installed at the tank inside or outside.

Installation from inside



Installation from outside

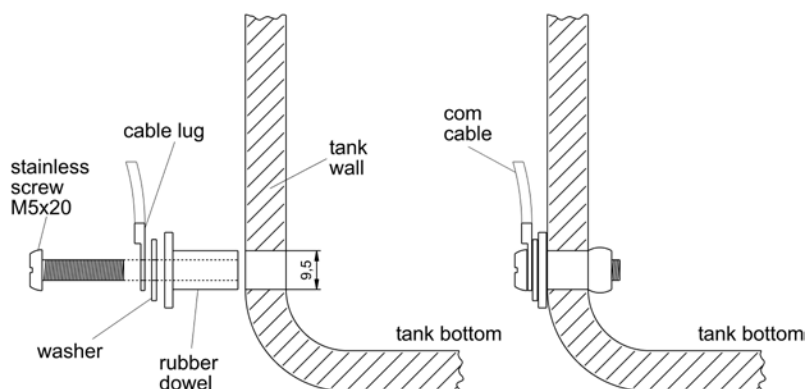


After that, straighten the cable probe, cut it to length and push the insulating **cap** on the **end of the probe**.

A safe zero point of the display is ensured, if a **clearance** of at least **10-20 mm** is left between tank bottom and end of the cable probe (tank bottom bulges up, if the tank is empty, due to deposits etc.).

A thorough sealing of the insulating cap on the cable probe is decisive for proper operation!

Installation of the Conductor at the Plastic Tank:



The conductor establishes the contact to the water.

Consequently, the bore hole \varnothing 9.5 mm for the **conductor** must be placed **as low as possible at the plastic tank**. Burr the bore hole!

Insert the 2.8mm faston connector to "com", cut the cable to length and crimp/solder the cable lug.

Install the rubber dowel with washer, cable lug and stainless steel screw M5x20.

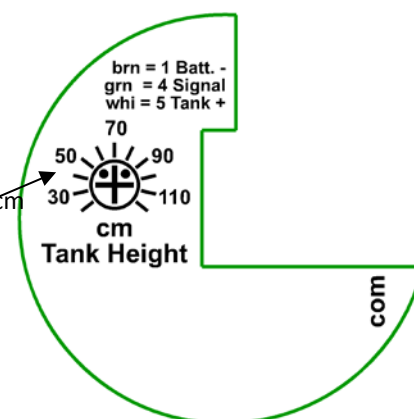
Tighten the screw, until the rubber dowel seals perfectly.

Connection of the Conductor to the Metal Tank:

Here, the tank establishes itself the contact to the water. Insert the conductor cable to the 2.8mm faston connector "com", and connect it conductively to the tank close to the transmitter, i. e. screw the cable lug conductively to the tank, adjacent to the transmitter.

How to set the adjuster Tank Height to "FULL" 100 %:

Example: The scale indicates the value 70 cm tank height



Configuration of Connections:

Colour	Connection No. Tank Display	Function	Recommended Cable Cross-Section
white	5 = Tank + (Plus)	+ Operating Voltage, from Display Unit Connection 5	0.5-1 mm ²
green	4 = Tank Signal	Measuring Signal to Display Unit Connection 4, 0...2.2 V	0.5-1 mm ²
brown	1 = Battery -	- Operating Voltage (Minus) or Body Ground, 1	0.5-1 mm ²

The tank electrode K-FL is protected against any kind of reverse battery. Despite, it is recommendable to use connection cables of different colours to avoid malfunctions due to mixed up connections.

As soon as the display unit has been installed according to the operating manual, the battery can be connected.

Start-up and Adjustment:

The adjuster at the upper side of the tank electrode is used to adjust the tank height to 100 % "FULL" at the display:

Insert a folding rule into the mounting hole of the tank to measure the exact tank depth (inside height), and set the adjuster for the "tank height" (water depth) to this value. The adjustment procedure is completed. The functions of the display can now be simulated with several water levels in the tank.

Fine adjustment of the set water depth can be corrected or changed at any time with full tank.

Final Installation:

Place the packing washers between tank, coupling ring PG29 and casing flange and screw the transmitter in place using the coupling ring PG 29.

In case of underfloor installation of the tank below the vehicle, the adjuster and the "com" connector must be protected with a permanently elastic sealant against aggressive environmental influences (de-icing salt etc.).

Tips and Tricks:

No reaction of display:

- a. Cable **4** = *Tank Signal* Withdraw by way of trial and direct it to connection "5": (Plus):
The display should increase to 100%! **Otherwise:**
- b. Battery connection or fuse defective → check!
- c. Cable **5** = *Tank Plus* interrupted → check!
- d. Cable **4** = *Tank Signal*: Short-circuit to *Minus / Ground* → check!

Constant display of 100 % on the display unit:

- a. Cable **4** = *Tank Signal* Withdraw it and direct it to ground: Display must be empty!
- b. Cable **1** = *Battery Minus / Ground* is interrupted or does not have any contact to the chassis → check!
- c. *The insulated cable* probe is contacting to water: The silicone cap is leaky or dropped off, the insulation of the cable probe is damaged → check!

Indication Errors:

- a. Intense soiling and furring of the insulated cable probe by stuck solids in the grey water tank and sewage water tanks
→ Rinse tank or clean it, if required! Do not use salt water!
- b. Bad contact of conductor "com" and water →, check the 2.8 mm faston connector, the stainless steel screw and the cable lug.



Safety Regulations and Appropriate Application:

The tank measuring sensor has been designed according to the valid safety regulations.

Application is only allowed, if the unit is in technically faultless condition, with protected board battery voltage of the indicated value and only for measurement of water or hydrous 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 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.
- 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.

Notes:

Notes:



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.



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.



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	7...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...110 cm
Mounting Hole	38 mm or thread PG 29
Flange Diameter	46.5 mm

Delivery Scope:

1 Tank Electrode 30-110 K-FL	1 Crimp Cable Lug (Conductor)
1 Coupling Ring PG 29	1 Stainless Steel Screw M5x20 (Conductor)
2 Packing Washer	1 Stainless Steel Washer (Conductor)
1 Rubber Dowel (Conductor)	1 Installation and Operating Manual
1 Conductor Cable, length 1.5 m, with 2.8 mm faston connector	

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