The new generation of tank monitors enables compact tank monitoring for yachts and vehicles with up to 3 (TCS) or 4 (VTM) tanks. Two battery groups the voltages can be monitored in parallel. The full colour TFT touch screen shows all tank levels and battery voltages at a glance, without the need to operate a button. The built-in brightness sensor automatically dims the screen in the dark and saves valuable energy.

All known philippi tank sensors such as TGT/TGW, UTV, TDS/TDN/TDT can be connected, even existing tank sensors from other manufacturers with the signals 10-180Ω / 240-180Ω / 0-3 (10) V / 4-20 mA are possible.

For battery and tank monitoring, individual minimum or maximum alarm thresholds can be defined for each battery and tank.

TANK MONITOR VTM/TCS

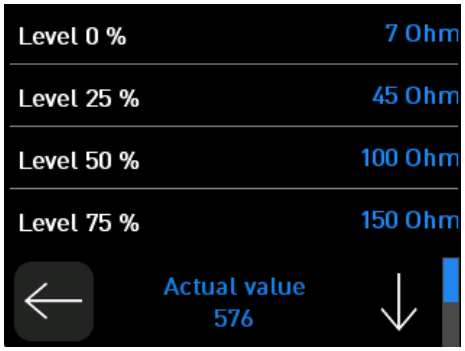
CONFIGURATION OF THE DISPLAY
For each connected tank sensor, the volume, tank type and sensor type can be entered in the setup and adapted to the tank geometry.

DISPLAY OF LITRES OR %
The tank volumes of the individual tanks can be stored in the setup, so that the filling levels can be displayed converted into litres. Alternatively, the % value or only the level bar can be displayed. It should always be noted that the litre display cannot be accurate to the litre (except for flow sensors) due to the limited resolution of the tank sensors!

POWER SAVE MODE
The tank sensors are queried by an interval measurement in order to reduce the current consumption of the system. If the supply voltage drops below 11.5 V / 23 V, the power save mode is activated and the polling frequency is reduced in order to further reduce the current consumption.

BATTERY AND TANK MONITORING
The alarm function that can be activated for each tank individually monitors the tank levels and gives an acknowledgeable acoustic alarm (duration 1 min.) if the set limit value is exceeded or not reached. If the battery voltage is lower or higher than the adjustable alarm thresholds, this is signalled by an acoustic alarm (1 min.) and flashing voltage value.

SIMPLE COMMISIONING VIA GRAPHICAL USER MENU
The settings are stored when the supply voltage fails and are available again when switched on again.



ADAPTATION TO NON-RECTANGULAR TANK GEOMETRIES
For non-rectangular tanks, the level indication can be freely entered via five level values 0, 25, 50, 75 and 100% in order to optimally adjust the level indication.
Alternatively, these values can also be accepted by the tank sensor at the push of a button during the initial calibration.
During the adjustment, the current measured value of the sensor can be read off.

Overview of our tank measuring systems

PRESSURE PROBE
The tank probes TDS/TDN are suspended as immersion probes to the bottom of a tank. The probe measures the current level in the tank via the hydrostatic pressure of the liquid.

- high resolution, no moving parts pieces
- up to tank heights of 2 m
- TDS for diesel, water, waste water
- TDN for water, waste water

FLOAT SENSOR
The universal tank sensor for everything except black water!

- Resolution 16mm,
- Very robust and durable
- Output signal compatible with the most fuel gauges
- TGT for diesel & petrol, grey water
- TGW for fresh water
- Unscrewable and screwable, thereby maintenance-friendly

- Display of tank levels of up to 3 tanks (TCS) or 4 tanks (VTM)
- Display of the voltages of 2 battery groups
- Adjustable alarm function for empty / full tank
- Adjustable alarm function for under- or overvoltage of the batteries
- Audible alarm via internal buzzer
- Direct connection of up to 3 tank sensors (TCS) or 4 tank sensors (VTM) on the back of the monitor

COMPATIBLE WITH ALL PHILIPPI TANK SENSORS AND SUITABLE LEVEL SENSORS OF OTHER MANUFACTURERS

Suitable tank sensors from p. 50:

- Tank sensor 10–180 Ohm (TGW / TGT)
- Tank sensor 240–33 Ohm
- Tank sensor 0–300 Ohm (free setup)
- Pressure probe TDS/TDN/TDT 4–20 mA
- Ultrasonic sensor 0,5 - 2,5 V (UTV)
- Ultrasonic sensor free adjustment of tank depth(UTV 40 / 80)
- Tank sensor 0–3,5 V / 0-10V (VTM)
- Tank sensor 0–1 (TRS 130 / RSW)

Modell	TCS	VTM
Order No..	0 7100 3040	0 7100 4010
Monitor	2.4" TFT col. touch screen graphic display with brightness sensor.	3.5" TFT col. touch screen graph. display with brightness sensor.
Display	tanks 1-3, adjustable / 2 battery voltages	tanks 1-4, adjustable / 2 battery voltages
Suitable for tank sensor	pressure probe / float sensor / ultrasonic	pressure probe / float sensor / ultrasonic / flow sensor
Relay output	Relay output: no	1 potential-free contact, function configurable
Rated Voltage	12 / 24 V	12 / 24 V
Consumption	max. 50 mA @ 12V, Stand-by: 6 mA	max. 80 mA @ 12V, Stand-by: 14 mA
Dimensions	W 105 x H 75 x D 28 mm	W 105 x H 105 x D 35 mm
Cut-out	W 87 x H 65 mm	W 88 x H 88 mm

Overview of our tank measuring systems

ULTRASONIC SENSOR

The non-contact level control measurement for waste water and holding tanks.
Level measurement only possible in horizontal position.
The use of a sound pipe improves the measurement and protects the sensor from contamination.
Unsuitable for fuel and water tanks.

FLOW SENSOR

Flow sensors are used wherever the fresh water tank is inaccessible, to install another tank sensor or where an exact litre display is required.
After refuelling, the monitor must be set to "full" again by hand.
The flow sensor is accurate to the litre and only suitable for fresh water!

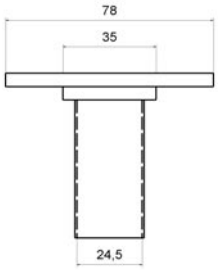
PRESSURE PROBE

The TDT tank probe is screwed into a G1/2“ threaded socket as a screw-in probe near the bottom of the tank. Via the hydrostatic pressure of the liquid, the probe measures the current level in the tank.
The tank probe TDT is suitable for diesel, water, and waste water tanks.

The tank probes TDS / TDN are suspended as a submersible probe to the bottom of a tank. Via the hydrostatic pressure of the liquid, the probe measures the current level in the tank. The PUR connection cable of the immersion probe contains a thin air hose for pressure compensation for the measuring cell. As a result, air pressure fluctuations compensate each other automatically and prevent measured value distortions.
The immersion probes TDS / TDN are suitable for diesel, water, waste water tanks, not for gasoline, kerosene, petroleum (EEx zone).
The scope of delivery includes a mounting flange and, if the tank depth is specified, a guide pipe for the mechanical guidance of the tank probe.

The pressure probes are used in conjunction with a
- Tank monitor TCS / BTM / VTM
- Tank interface CMT 2 (system monitors PSM/PSL)
- an Interface UTI (analog (round) measuring instruments) is used.

Pressure probe TDS/TDN



To take a
M25 installation pipe

Type	TDT 10-250	TDS 200	TDN 200
Item-No..:	6 6020 0250	6 6026 1206	6 6025 1208
Use	Screw-in probe	Submersion probe	
Version	Thread G1/2“	Submersion cable PUR black, length 2,5 m, oil-resistant	
Material housing	stainless steel 1.4404 (316 L, V4A)		
Tankmedien	diesel, water, grey water, black water	diesel, water, grey water, black water	water, grey water, black water
Range	0 - 250 mbar	0 - 200 mbar	
Resolution	1 cm	1 cm	
Max. depth of tank	250 cm	200 cm	
Operation temperature	0 – 85 °C	0 – 40 °C	
Dimensions	L 87, Ø 35 mm	L 97 mm, Ø 22 mm	
signal output	DC 4 – 20 mA, 2-wire-principle		
Operation voltage	10 – 30 V DC via 2 wire lines		
Weight	approx. 0,2 kg, without cable		

UNIVERSAL TANK INTERFACE UTI

The UTI interface is required to connect the tank probes TDS, TDN, TDT to analog round instruments with voltage or resistance input. It converts the 4 - 20 mA signal of the tank probe into a voltage (0.5 -2.5 V) or resistance signal (10 - 180 Ω).
In addition, the tank height can be adjusted on the interface so that the full signal of the tank probe TDS, TDN, TDT matches the display.

The universal tank interface can be used to adapt analog measuring instruments to different tank sensor systems.
Any combination is possible, e.g. a conversion of
10 - 180 Ω to 240 - 33 Ω.

The following tank sensor systems can be connected:
- Tank sensor with resistance signal 10 - 180 Ω resp. 240 - 33 Ω
- Tank sensor with voltage output 0 - 10 V
- Tank sensor with current signal 4 - 20 mA

The following measuring instruments can be connected:
- Instruments with resistance input 10 - 180 Ω or 240 - 33 Ω
- Instruments with voltage input

UTI	Item-No.: 0 8000 1500
Operation voltage	10 – 30 V DC
Consumption	10 mA
Output signal	10 – 180 Ω, 240 – 33 Ω, 0,5 – 2,5 V
Dimensions	W 130 x H 80 x D 42 mm

To monitor the fluid levels of all tanks on board the high resolution sensor series TGT/TGW are the first choice. The tank sensors are constructed for vertical installation in water and fuel tanks.
Thanks to it`s flange mounting it`s easy to unscrew and take out the tank sensor at any time for inspection purposes.

- The sensors have reed contacts each 16 mm giving a very high resolution over the entire field instead of common simple systems with few contacts only.
- The advantage over the normal sensors with a lever is the space saving and reliable construction
- The electronic is galvanicly insulated from the housing. This is important to avoid galvanic corrosion.

- **Fuel 52** Item-No.: **2 0778 0541**
- **Water 52** Item-No.: **2 0778 0601**

Analogue gauge ∅ 52mm:
Fuel for tank sensors series TGT
Water for tank sensors series TGW
For the operation at 12 V DC. Operating at 24 V DC requires a resistor "Rturo" Order Nr.: **2 0800 2000**

- **TAN 101** Item-No.: **0 2800 0510**

Panel with rocker switch (0-1) for a single analogue gauge ∅ 52 mm.
Dimensions 110 x 72,5 x 40 mm (90 mm incl. gauge)

Tank sensors for gasoline/fuel

Type	Numbers of switch cont.	Required min. tank depth	Item-No.:
TGT 200	7	185 mm	**6 6011 7080**
TGT 250	10	235 mm	**6 6011 7081**
TGT 300	13	285 mm	**6 6011 7082**
TGT 350	16	335 mm	**6 6011 7083**
TGT 400	19	385 mm	**6 6011 7084**
TGT 450	23	435 mm	**6 6011 7103**
TGT 500	26	485 mm	**6 6011 7085**
TGT 600	32	585 mm	**6 6011 7086**
TGT 700	38	685 mm	**6 6011 7087**
TGT 800	44	785 mm	**6 6011 7088**
TGT 900	50	885 mm	**6 6011 7089**

Flange and gasket are included in delivery!

Tank sensors for water

Type	Numbers of switch cont.	Required min. tank depth	Item-No.:
TGW 200	7	185 mm	**6 6011 7091**
TGW 250	10	235 mm	**6 6011 7092**
TGW 300	13	285 mm	**6 6011 7093**
TGW 350	16	335 mm	**6 6011 7094**
TGW 400	19	385 mm	**6 6011 7095**
TGW 450	23	435 mm	**6 6011 7104**
TGW 500	26	485 mm	**6 6011 7096**
TGW 600	32	585 mm	**6 6011 7097**
TGW 700	38	685 mm	**6 6011 7098**
TGW 800	44	785 mm	**6 6011 7099**

Flange and gasket are included in delivery!

- **GWA** Item-No.: **6 6010 9010**

Adapter flange for the installation of tank sensors TGT /TGW to a given screw-hole circle matching the SAE-Norm. Incl. are gasket and screws. Built-on height:18 mm

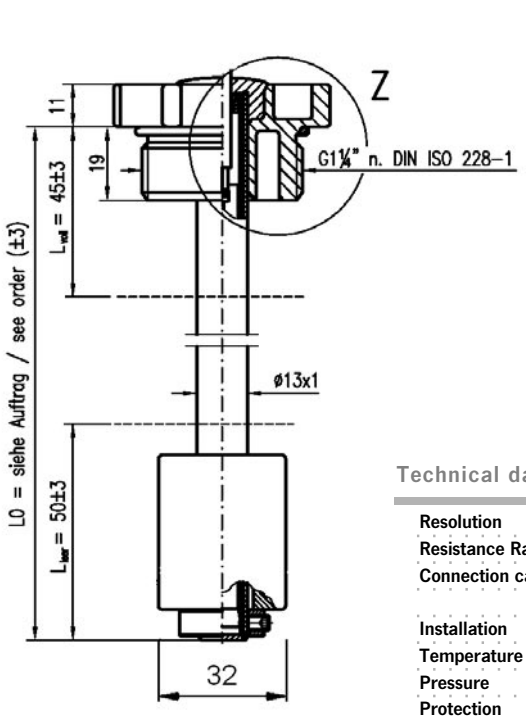
- **GWF** Item-No.: **6 6010 9000**
- **GWW** Item-No.: **6 6010 9002**

Flange with rubber gasket for fuel (GWF),
Flange with rubber gasket (GWW), food safe.

- **TRV** Item-No.: **6 6011 9000**

Cover cap to close the tank during maintenance.

The head of the sensor inclusive flange is 32 mm over the tank surface.



Technical data TGT/TGW

Resolution	16 mm
Resistance Range	5-180 ohm
Connection cable	2x 0,34 qmm, length 10 cm
Installation	vertical, ± 20°
Temperature	-10..+70 °C
Pressure	max. 1 bar
Protection	IP 65

The contactless measurement of liquid level in tanks using ultrasonic technology does not require mobile parts any more to be gotten dirty or damaged. Due to this fact they`re suitable especially for the measuring inside a waste water tank.

SYSTEM CAUSED LIMITATIONS:

The „off“ zone 5 cm directly underneath the sensor cannot be measured and the display shows possibly wrong values. The distance ring UTS serves as compensation for this zone.

While a boat is under way, the heeling and swell makes a measurement impossible. By using a focus tube UFT the measurement will be improved. It protects the sensor from dirt and stain and improves the measurement if there`s a froth on the liquid surface. Another positive effect is the acoustic decoupling at metal tanks, where a feedback could disturb the measurement.

SUMMARY:

- we recommend ultrasonic sensors only for waste water tanks, especially in connection with a focus tube UFT.
- for fuel and water tanks they`re not really recommended because of the off zone (5 cm underneath the sensor) if the tank is full or nearly full.
- While the boat / vehicle is under way you don`t get a reliable measurement.

Distance ring for balancing of the off zone

UTV 20	200 mm	**7 0219 3520**
UTV 25	250 mm	**7 0219 3525**
UTV 30	300 mm	**7 0219 3530**
UTV 35	350 mm	**7 0219 3535**
UTV 40	400 mm	**7 0219 3540**
UTV 45	450 mm	**7 0219 3545**
UTV 50	500 mm	**7 0219 3550**
UTV 60	600 mm	**7 0219 3560**
UTV 70	700 mm	**7 0219 3570**
UTV 80	800 mm	**7 0219 3580**

Focus tube

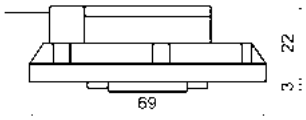
UFT 40	400 mm	**7 0219 9400**
UFT 80	800 mm	**7 0219 9800**

Incl. in delivery is a gasket
Built-on height 6 mm.

Distance ring

UTS 25	25 mm	**7 0219 9025**

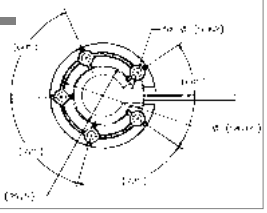
Incl. in delivery are a gasket and 5 screws



Installation hole has to be min. 36 mm, while using a focus tube it has to be 40 mm.

Technical data UTV

Input voltage	10 – 30 V
Consumption	50 mA
Output signal	0,5 V - 2,5 V
Switch-on time	5 s (1. measurement)
Averaging time	50 s
Temperature range	-40°C to +85°C



Waste UTV No.: **2 0778 2041**

Analogue gauge matching the ultrasonic sensor UTV.
Operation at 12 V and 24 V DC.

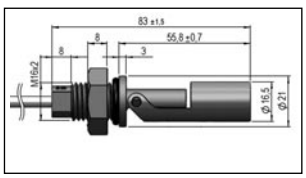
TRS 130 Item-No.: **6 6011 7102**

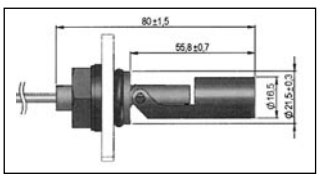
Tank sensor for waste water tank with indication of 3/4 level of the tank. Full indication on 80 mm before reaching the upper level. Matching for tank depths from 200 to 400 mm.
Sensor length is 120 mm.
Delivery with flange & gasket.

FAF -12V Item-No.: **0 2801 1020**
FAF -24V Item-No.: **0 2802 1020**

Monitor panel for waste water tanks with optical and acoustical alarm. The acoustic alarm is acknowledgeable by a push button. Suitable for sensors TRS 130 and RSW / DSW.

Dimensions
L 105 x W 52,5 x D 50 mm





RSW Item-No.: **0 8930 0008**

Float lever for installation on the side of tanks for sensoring of the level. Depending on the installation position the switch opens or closes if the inside level rises or falls. Housing -material Polyamid black suitable for oil or diesel.
Max. switching current: 0,5 A. Installation from inside to outside.

DSW Item-No.: **0 8930 0019**

Same function as float lever RSW. The DSW can be installed from outside without installing a counternut from inside. The installation is easy, because the DSW has a gasket ring which can be tightened from outside. Mounting hole: ø 22 - 24 mm. Gasket 12 mm wide for wall thickness of max. 5 mm. Only able to take small filling pressure. Max. switching current: 0,5 A. Installation from outside!

The Gobius C tank sensor is using microradar technology to measure the tank level from above and outside the tank. This works with tanks made of plastic or GRP through The wall thickness is irrelevant. For metal tanks, a hole of approx. 40 mm must be drilled in the tank. The existing opening of an existing sensor can be used for this.
The measurement works continuously for all liquids (petrol, diesel, fresh, grey and black water), noiselessly and with high accuracy. Unaffected by foam, vapours, pressure and dust.
Suitable for tank depths from 20 to 200 cm.

Output signals:

digital	2x for alarm-LED
analog	4–20 mA (galvanic isolated)
	10–180 Ω & 240–33 Ω, 0–5 V
LED	Display battery

Mounting:
For plastic and GRP tanks, the sensor is attached to the top of the tank using the enclosed 3M adhesive tape. If you have a metal tank, a hole of approx. 40 mm is required.

A Gobius C adapter is available for this purpose (order no. 7 0097 0600), which is compatible with the VDO and Wema standard threaded flange.

- **Gobius C (orange)** Item-No.: **7 0097 0526**
- **Gobius C NMEA (black)** Item-No.: **7 0097 0534**
- **Gobius C Basic (green)** Item-No.: **7 0097 0530**

Gobius C: Analogue and digital outputsGobius C NMEA: With NMEA 2000 interface instead of analogue outputs Gobius C Basic: Only with 10-180 Ω output for analogue round instruments Supplied incl. plug-in or flanged connection cable, length 1 m.
Configuration is done with the Bluetooth APP.

Resolution/Accuracy	+/- 2-3 mm
Operating voltage	DC 9 - 30 V
Consumption Standby	20 mA @ 12 V
Weight	65 g
Sensor height with metal tank adapter	H 75 mm
Protection class	IP44
Dimensions	L 65 x W 95 x H 65 mm

Tank gauging from the outside - no drilling necessary!
The Gobius Pro tank sensors are simply stuck to the side of the tank from the outside. Each sensor recognises acoustically whether there is liquid behind the tank wall.
This enables quick and easy installation, as no holes need to be drilled in the tank. No contamination of the sensors as there is no direct contact with the medium.
The Gobius pro model sends its information to a smartphone via Bluetooth. An app can be used to configure up to 8 sensors per tank and display the fill level.

Suitable for all tank-materials:

Steel / stainless steel	Wall thicknesses 1-3 mm
Aluminium	Wall thicknesses 2-5 mm
Plastic (Polyethylen)	Wall thicknesses 2-10 mm
Glasfiber	Wall thicknesses 4-8 mm

- **GOBIUS Pro** Item-No.: **7 0097 0481**

There are 2 switching contacts on the sensor for activating a remote status display for example.

Rated voltage	12 V/24 V
Consumption active	100 mA / 10 mA (idle)
Output signal	switching output, Bluetooth
Dimensions sensor	H 26 mm, Ø 70 mm

FLOWSENSOR FOR WATERTANKS

- **DFS 24** Item-No.: **7 0003 0324**

Flow sensor for fresh water for connection to a digital tank monitor TCS, BTM, VTM. Flow rate 1-25 l/min. Connection flange for hose 10-12 mm, cable length 20 cm.
1000 Impulse/L.

Dimensions	L 110 x W 23 x H 57 mm

- **DFF 1/2"** Item-No.: **7 0003 9002**

Connection flange for hose 1/2" 1 pc.