

The well readable digital tank monitor TCM shows a clear overview of the filling conditions of up to four tanks, e.g. a water, a fuel and a waste water tank. The measuring of liquid level resulted by proven immersion tubes TGT/TGW that are available in different lengths or with ultrasonic sensors series UTV. Older level sensors series TRG or level sensors with different characteristics (240-33 Ohm, 0-90 Ohm,...) can also be connected. Active level sensors with current output 4-20 mA are also connectable. The tank monitor TCM 2 and TCM 4p calculates the water tank level by a flow rate sensor DFS. The calculation of the level is made by a math-integration algorithm. The fill up reset (100%) is made just by pressing a key when the tank is fully. The tank symbols can be chosen individually by the setup. An interval measurement procedure reduces the energy consumption to a minimum. Case the voltage comes under 12 V, the measurement interval increases further reducing the battery consumption.

The size of the individual tank can be stored in the setup, so the measuring value can be shown in liters or in percentage. Please keep in mind that because of the limited resolution of the sensors, the shown liters/level will never be exact. To adjust the displayed level to non-rectangular tanks a correction factor can be set in the setup for each tank.

An alarm buzzer (duration max. 2 min) with a acknowledge function advise about the tank level coming out of a limit. The threshold level can be set in the setup menu. Additionally, the voltage of two batteries can be displayed in the models TCM 1 and TCM 2. A warning symbol indicates battery voltage lower than 11 V or greater than 15 V.

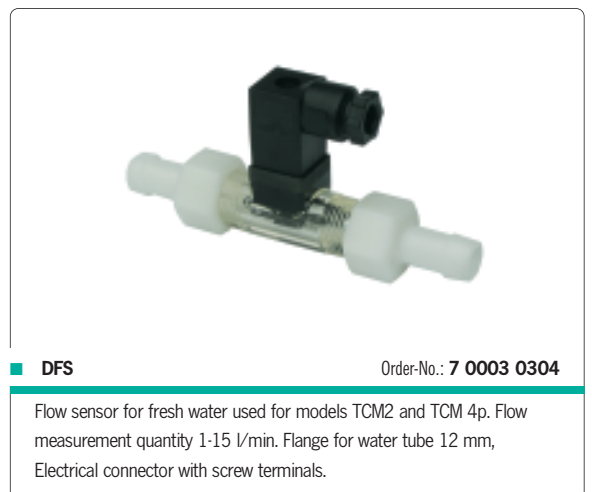
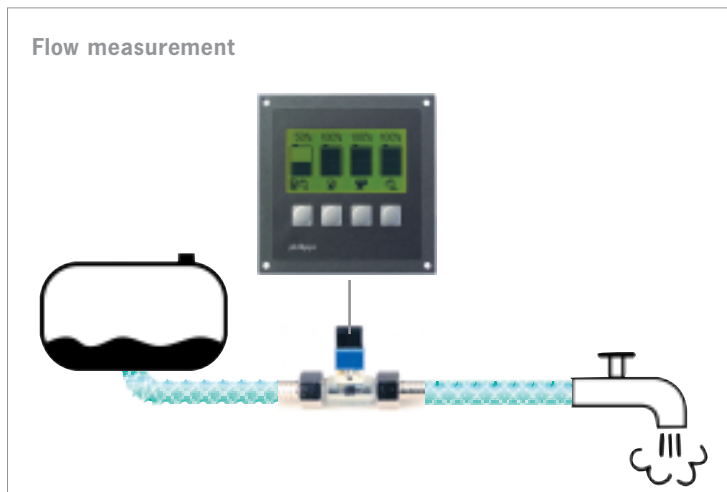
Ultrasonic sensor UTV, immersion tubes TGT, TGW, TRS and flow sensor DFS have to be ordered separately.



Technical data TCM

Input voltage	8-30 V
Dimensions	105 x 105 x 40 mm
Cut-out	90 x 90 mm

Type	TCM 1	TCM 2	TCM 4	TCM 4p
Order-No.:	0 8000 1003	0 8000 1012	0 8000 1400	0 8000 1410
Number of tanks	3	3	14	14
Flow sensor DFS	0	1	0	1
Tank sensor TGT/TGW/UTV	3	2	14	1-3
Voltage measurement	2 batteries	2 batteries	no	no
Current consumption	2 mA	9 mA	2 mA	9 mA



▶ ULTRASONIC TANK SENSOR

The contact less measurement of liquid level in tanks using ultrasonic technology does not require mobile parts any more to be gotten dirty or damaged

The sensor emits an acoustic wave perpendicularly to the liquid surface and detects the reflection from the liquid material. The distance from the sensor to the material surface is computed based on the speed of sound and the time between emission and reception of the waves. To get correct measurement, the waves must hit the liquid surface perpendicularly ($\pm 6^\circ$). Fluctuations in the level of the liquid in the tank due movements become balanced by a continuous measurement and a special computing algorithm. The off zone from the face of the sensor is only 5 cm . This range cannot be measured, and is interpreted as full tank. In cases where it is not possi-

ble to fix the sensor parallel to the liquid surface, a tube with min. 30mm diameter is attached in the tank with a maximum angle of 15° .

The ultrasonic tank sensors can be easily exchanged against existing conventional tank sensors that has the attachment according to the SAE standard (5 mounting holes in the pitch diameter of 53 mm). The output signal of the ultrasonic sensor UTR is designed to operate in the resistance range of 240..33 Ohm and is connected through a 2-wire line (Measurement range 240..33 Ohm).

The ultrasonic level senders are available for tank depths of 20 - 80 cm, in steps of 5 cm and have to be connected to the matching gauges (240 - 33 Ohm). The operation at 24V is possible under the use of a pre-resistor (R-turo, Order-No. 2 0800 2000) in the supply line.



Ultrasonic tank sensor UTR for Instrument 240..33 Ohm

Type	tank depth	Order-No.:
■ UTR 20	200 mm	7 0219 3320
■ UTR 25	250 mm	7 0219 3325
■ UTR 30	300 mm	7 0219 3330
■ UTR 35	350 mm	7 0219 3335
■ UTR 40	400 mm	7 0219 3340
■ UTR 45	450 mm	7 0219 3345
■ UTR 50	500 mm	7 0219 3350
■ UTR 60	600 mm	7 0219 3360
■ UTR 70	700 mm	7 0219 3370
■ UTR 80	800 mm	7 0219 3380



Ultrasonic tank sensor UTV with voltage output 0,5 V - 2,5 V

Type	tank depth	Order-No.:
■ 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

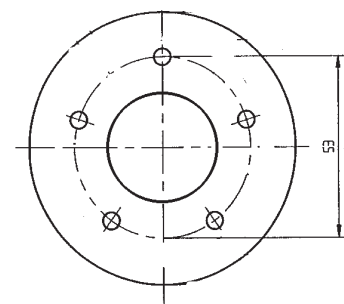
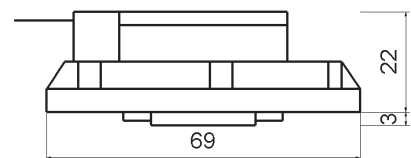


- Water UTR 52 Order-No.: 2 0778 1721
- Fuel UTR 52 Order-No.: 2 0778 1741
- Waste Water UTR 52 Order-No.: 2 0778 1701

Gauges matching the ultrasonic sensors series UTR. Green coloured LED-Illumination. Operation at 24 V DC only by using a preresistor „Rturo“ Order-No.: 2 0800 2000

The height above the tank surface amounts 25 mm. The diameter of the sensor is 69 mm.

The hole in the top of the tank for the sensor must be at least 36 mm.



Technical data UTR/UTV

	UTR	UTV
Voltage range	10 – 18 V	10 – 30 V
Consumption	50-70 mA	50 mA
Output signal	240..33 Ohm	0,5V-2,5V
Turn on delay	2-3 s (first measurement)	
Averaging time	50 s (continuous indication)	
Temperature range	-40°C to +85°C	



Fuel 52 Order-No.: **2 0778 0541**

Measuring instrument for fuel tanks matched to the sensor of the series TGT. For the operation at 12 V DC. Operating at 24 V DC requires a resistor "Rturo" Order Nr.: **2 0800 2000**

To monitor the 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. It is possible to mount it in the flanges permitting its removal 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 against the normal sensors is the space saving and the dependable display
- The electronics is galvanic insulated from the housing. This is important to avoid galvanic corrosion.



Water 52 Order-No.: **2 0778 0601**

Measuring instrument for water tanks matched to the sensor of the series TGW. For the operation at 12 V DC. Operation at 24 V DC requires a resistor "Rturo" Order Nr.: **2 0800 2000**

Tank sensor for gasoline/fuel

Type	Tank depth	Order-No.:
■ TGT 200	185 mm	6 6011 7080
■ TGT 250	235 mm	6 6011 7081
■ TGT 300	285 mm	6 6011 7082
■ TGT 350	335 mm	6 6011 7083
■ TGT 400	385 mm	6 6011 7084
■ TGT 450	435 mm	6 6011 7103
■ TGT 500	485 mm	6 6011 7085
■ TGT 600	585 mm	6 6011 7086
■ TGT 700	685 mm	6 6011 7087
■ TGT 800	785 mm	6 6011 7088

Flange and gasket are included!



Flange with rubber gasket for fuel GWF



Other length on request.

Tank sensor for water

Type	Tank depth	Order-No.:
■ TGW 200	185 mm	6 6011 7091
■ TGW 250	235 mm	6 6011 7092
■ TGW 300	285 mm	6 6011 7093
■ TGW 350	335 mm	6 6011 7094
■ TGW 400	385 mm	6 6011 7095
■ TGW 450	435 mm	6 6011 7104
■ TGW 500	485 mm	6 6011 7096
■ TGW 600	585 mm	6 6011 7097
■ TGW 700	685 mm	6 6011 7098
■ TGW 800	785 mm	6 6011 7099

Flange and gasket are included!



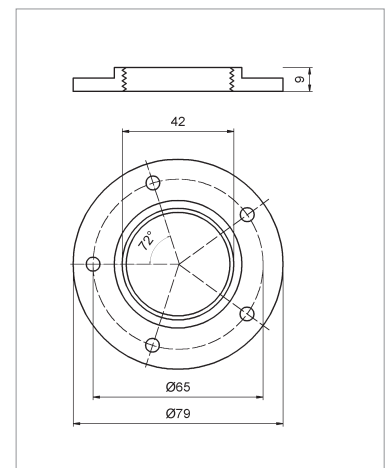
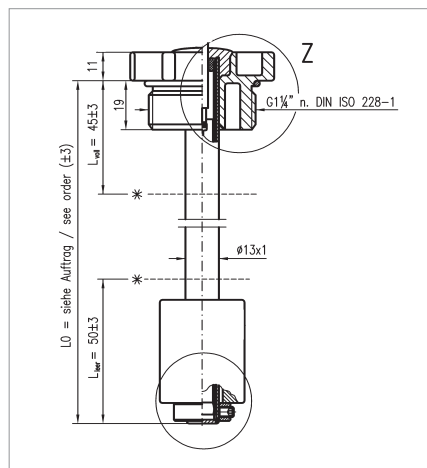
Flange with rubber gasket for water GWW
Foodsafe Order-No.: **6 6010 9002**



Technical data

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

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



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

Cover cap to close the tank during maintenance.





TANK MEASUREMENT



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

Panel with rocker switch (0-1) for one instrument \varnothing 52 mm.

Dimensions W 110 x H 72,5 x D 40 mm



TAN 102 Order-No.: **0 2800 0520**

Panel with 2 rocker switches (0-1) for two instruments \varnothing 52 mm

Dimensions W 110 x H 145 x D 40 mm



AS 100-12V Order-No.: **6 0360 4320**
AS 100-24V Order-No.: **6 0360 4340**

Buzzer

Dimensions \varnothing 27 x 18 mm



SENSOR FOR WASTE WATER



FTA -12V Order-No.: **0 2801 1010**
FTA -24V Order-No.: **0 2802 1010**

Monitor panel for waste water tank with optical and acoustic alarm. The sound alarm is acknowledgeable by a push button. Suitable for sensor type TRS 130.

Dimensions W 110 x H 72,5 x D 50 mm



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

Monitor panel for waste water tank with optical and acoustic alarm. The sound alarm is acknowledgeable by a push button. Suitable for sensor type TRS 130.

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



Waste Water 52 Order-No.: **2 0778 0771**

Measuring instrument for waste water tanks matched to the sensor of the series TGW. For the operation at 12 V DC. Operation at 24 V DC need a resistor "Rturo" Order Nr.: **2 0800 2000**



TRS 130 Order-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. The minimum depth acceptable is 120 mm. Delivery with flange gasket.



TRR 130 Order-No.: **6 6011 8130**
TRR 250 Order-No.: **6 6011 8250**
TRR 350 Order-No.: **6 6011 8350**

Fitting protective tube for TRS 130/250/350 to prevent the pollution of sensor. Mounting flange to screw in the sensor. External diameter of the protective tube 50 mm.



TRS 250 Order-No.: **6 6011 7105**
TRS 350 Order-No.: **6 6011 7108**

Tank sensor for waste water tank to measure the filled level with high precision. Reed contacts with a resolution of 16 mm. Applicable for tank depths from 240 mm and 340 mm.