



# Electronic Evaporation Meter

7061.0000 BG

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Issue.	Date		Name



## Description

The electronic evaporation meter - type 7061 - permits the measuring of evaporation rate at free surfaces of water.

This instrument is based on following formula:

$$V = \frac{2.13 * U^{0.65}}{P} * (EW - eL)$$

The parameters are:

- V Evaporation in mm/10 min
- U Wind speed in m/s, measuring height 1 m
- P Air pressure in hPa
- EW Saturation vapor pressure at the water surface in hPa (according to water temp. at the surface)
- eL Actual vapor pressure of the surrounding air in hPa, measuring height 1 m

Accordingly the parameters wind speed, humidity and temperature of the air at 1 m level as well as the water temperature directly under the surface are measured and processed by this instrument.

Hereby EW is computed from the water temperature by using the MAGNUS-formula and eL from the humidity and temperature using the psychrometric formula by SPRUNG. For the air pressure the mean pressure value at the measuring site may be used.

The battery-operated data acquisition system stores the amount within 10 minutes and the hourly and daily amount of evaporation within the data logger, resp. on the memory card.

## Mechanical design

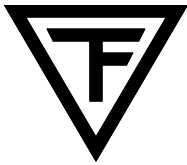
(Refer to diagram, fig. 1, page 2.)

For mounting the sensors a mast (6) with cross-arm (5) is used, being attached to buoy system (7) ... (13). Counter balance (11) and stabilizing buoys are adjusted so that the wind sensor (1) and the sensor for humidity and temperature have a height 1 m above the water surface.

For measuring the wind speed a cup anemometer (1) -type 4041- is used, providing a frequency of 0...40 Hz corresponding 0...60 m/s. (Refer to description 4041.0000 BG).

On a separate crossarm with supporting buoy the water temperature sensor (3) -type 2018 - is mounted, being a sealed and waterproof measuring resistance Pt 100 Ohm (Refer to description 2018.0000 BG). The data logger and the power supply are located in a stainless steel housing (7) at the mast.

This housing is designed according to the protective class IP 65. The lid is fastened by hinges and may be opened and closed by a locking handle.

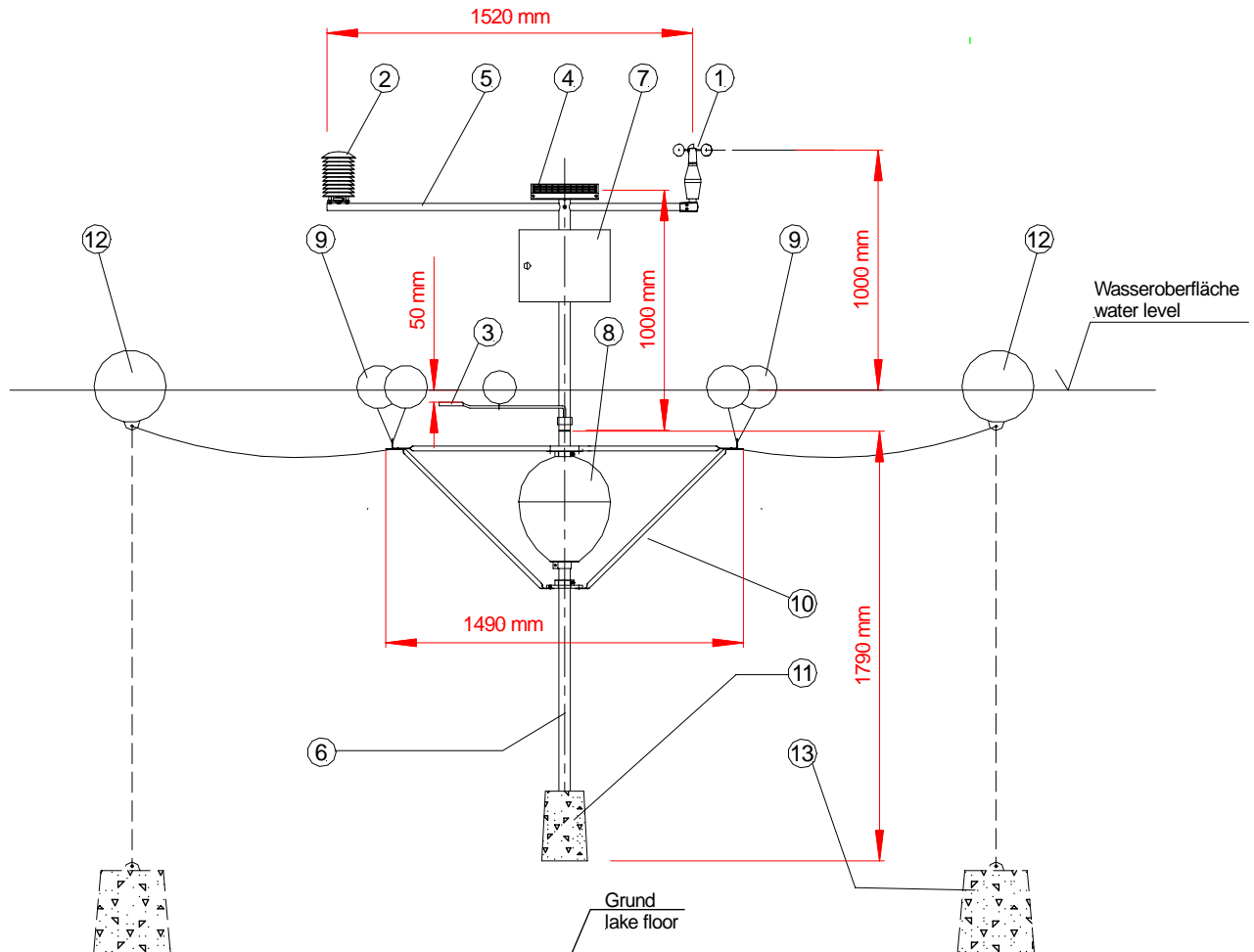


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Fig. 1: Mech. Configuration, compl. assembly

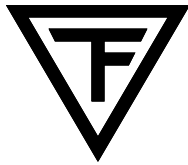


## Legend

- |                                                        |                                        |
|--------------------------------------------------------|----------------------------------------|
| 1. Wind speed sensor                                   | 7. Independent data acquisition system |
| 2. Combined Temperature/ Humidity Sensor<br>in shelter | 8. Main buoy                           |
| 3. Water temperature sensor                            | 9. Stabilization buoys *               |
| 4. Solar panel                                         | 10. Stabilization arm *                |
| 5. Cross arm                                           | 11. Counter balance                    |
| 6. Mast                                                | 12. Anchoring buoys *                  |
|                                                        | 13. Anchors * **                       |

\* 3 ea. of 120 degree distance

\*\* not part of the deliveries



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## Operating principle

All sensors are scanned every 10 minutes. Hereby the wind speed is determined from a 10 minutes wind run integration. After this the measured data are stored and the evaporation is computed according to the formula given above.

After each period of 10 minutes the mean values of the temperatures and wind speed are computed as well as the 10 minutes total amount of evaporation. Also the actual hourly and actual daily amount of evaporation is computed every 10 minutes. The total hourly amount of evaporation is computed at the beginning of every hour. And the total daily amount is computed at the beginning of every day. The data are stored in the internal memory, resp. in the memory card.

## Technical Data

Sensors:	Refer to individual descriptions
Data acquisition:	Refer to 1020.2000
Power supply:	with 10 W solar panel, battery, 12 V, 7 Ah, maintenance-free
Average power consumption:	43 mA
Dimensions:	Ref. to fig. 1
Weight:	Complete system without ground anchors – approx. 64 kg
Operating temperature:	-10 ... +50 °C

## Ordering Code

Electronic Evaporation Meter – c/w **7061.0000**  
sensors, data acquisition system,  
battery, including buoy system  
- without ground anchors -

## Operation instructions

### Installation

1. As ground anchors standard concrete bases approx. 36 kg's in weight may be used.
2. The complete system shall be installed according to fig. 1. The system will be supplied completely wired. The position of the ground anchors and their ropes depends on local conditions.
3. Check measuring height 1 m above water surface. This height is adjusted correctly at the factory, but may be corrected by vertical positioning of the mast in its sleeve.

### Operation

1. Connect the battery cable (plug and socket).  
**Attention!**  
*Do not remove the covers from the solar panels before connecting the battery!*
2. The system starts for operation automatically after connection of the battery.
3. **Attention!**  
*Before changing the battery (after a 10-day run at latest), the fuse terminal has to be opened, in order to open the 12 V circuit.*

Technical data are subject to change!