

WATERPROOF MULTIFUNCTION METER CX-461

CX-461 belongs to the newest generation of highly accurate measuring devices. The meter is designed for accurate measurements of: pH, redox potential (mV), conductivity, salinity, resistivity of the measured liquid, oxygen dissolved in water or oxygen saturation in air, atmospheric pressure and temperature.

It is distinguished by large 3,2" colour graphic touch screen.

It is possible to choose a version with **GXZ-3tk** multifunction (multi-parameter) head with electrodes for simultaneous measurement of three different functions (e.g. pH, conductivity and oxygen dissolved in water with temperature) or version with single electrodes. The models have different connectors.

Innovative technical solutions and high accuracy for affordable price.

Characteristic features:

- **CX-461** may be used for laboratory and field measurements.
- Enables simultaneous measurement of 1 to 4 functions with displaying their results on the screen at one time.
- Unification of the operating procedures in all measuring functions makes working trouble-free.
- "HOLD" function to freeze the result on the display.
- Signalisation of the result stabilisation with "READY" symbol and sound.
- Possibility of sending a calibration report to a PC - up to 10 last calibrations.
- Low weight and small size make working in the field easier.
- Waterproof housing (IP-66) enables working in difficult conditions.



In the pH measuring function:

- Depending on the kind of applied electrode it may be used for clean water, sewage, soil, pastes, etc.
- Calibration of the pH electrode in 1 ÷ 5 points.
- Automatic detection of buffer solutions, their values may be set the user.
- Automatic correction of the stored pH standard value along with the temperature changes for NIST standards, what eliminates the necessity of the temperature adjustment.
- Possibility of storing characteristics of 3 pH electrodes enables their quick replacement - very useful feature during field work.
- Automatic evaluation of the electrode's condition.
- Possibility of viewing the electrode's parameters (offset and slope).
- The measuring circuits of pH and conductivity are isolated what enables accurate and error free simultaneous measurements in the same vessel.

In the mV and redox potential measuring function:

- Precise redox potential measurement (accuracy 0.1mV).
- Possibility of mV measurement in relation to the set or measured reference potential (Vref).

In the conductivity measuring function:

- Full measuring range enables measurements in ultra pure water as well as in very salty solutions.
- 6 sub-ranges switched automatically.
- In case of measurements of natural water with conductivity from 60 $\mu\text{S}/\text{cm}$ to 1 S/cm the meter enables using non-linear temperature compensation. The parameters of this type of water are determined in norm EN27888:1999 and concern surface water, deep water and well water. This solution lowers the measurement error.
- The measurement accuracy of the ultra pure water with temperature compensation was increased by automatic adjustment of the α coefficient depending on the temperature and kind of trace contaminations.
- Calibration by entering the constant K of the cell or in standard solutions in 1 to 5 points.
- Ability to store constants K of three cells, which cover the whole conductivity range.
- Wide range of α coefficient $0 \div 10 \text{ \%} / \text{ }^\circ\text{C}$ chosen depending on the measured solution.
- Calibration by entering the constant K in range $0.010 \div 20.000 \text{ cm}^{-1}$ or in buffer solution.
- Possibility to store constants K of 3 cells, which cover whole measuring range.
- Possibility of changing the reference temperature.
- Automatic calculation of conductivity into salinity in NaCl or KCl on the basis of the actual characteristics instead of a constant coefficient, what greatly increases accuracy.
- Possibility of defining the TDS with entering the TDS coefficient in range $0.2 \div 1.0$.
- The liquid resistivity measurement option added.
- Possibility to make measurements of electric admittance of tree seedlings (determining the vitality of seedlings with a special sensor).
- High accuracy conductivity cell **ECF-1** available as additional equipment. Measuring range: $0 \div 400 \text{ mS}/\text{cm}$ is sufficient for conductivity measurements in majority of liquids of maximal concentration, e.g. aqueous soil extracts and water with grease or oil. Metal electrodes are easy to clean. Plastic housing protects from mechanical damage.

In the oxygen measuring function:

- Automatic calculation of atmospheric pressure influence on oxygen concentration in water in mg/l .
- Automatic transfer of the salinity measured in the conductivity mode to the oxygen measurement mode with calculation of its influence on the oxygen content value.
- 1 or 2 point oxygen sensor calibration.
- In case of oxygen measurements it is recommended to buy an accurate, easy in use and maintenance galvanic **COG-1** oxygen sensor.
- Wide measuring range enables measurements in lakes with blooming vegetation.

In the atmospheric pressure measuring function

- Possibility of continuous observation of atmospheric pressure value on the meter's screen.

Other features:

- Internal clock with date.
- Storing parameters of 3 temperature probes.
- Possibility of entering the sensor group for selective temperature probe, what increases the accuracy level.
- Collecting up to 2000 data sets in the internal datalogger with temperature, time and date, single collecting and also taking series of measurements with given time interval possible – all measured functions are stored.
- Non-volatile memory of the stored results and calibration data
- Storing the next calibration date and signalling it of the user.

- Possibility of choosing the language of the displayed information : Polish, English or German.
- Possibility of connecting with a PC by micro USB connector
- Software for data transmission and collection delivered in the set.
- Powered by 2 x AA (1.5 V) rechargeable batteries, or by power adapter with internal battery charging.
- Continuous work time without charging up to 18 hours depending on the chosen function and set brightness of the screen.
- The meter meets the GLP requirements.
- 24 months of warranty for the meter.

The additional equipment should be chosen by the user depending on the predicted parameters which will be measured and type of measured solutions.

The standard set includes **CT2S-121** temperature probe with **Pt-1000S** resistor.

TECHNICAL DATA

Function	pH	mV	Conductivity / Salinity	O ₂ (mg/l)	O ₂ (%)	Temperature
Range	-6.000 ÷ 20.000 pH	±2000.0 mV	0 ÷ 2000.0 mS/cm (autorange) 0 ÷ 239 g/l KCl 0 ÷ 296 g/l NaCl	0 ÷ 60 mg/l	0 ÷ 600 %, in air: 0 ÷ 100 %	-50.00 ÷ 200.00 °C -58.00 ÷ 392.00 °F 223.15 ÷ 473.15 K
Accuracy (± 1 digit)	±0.002 pH*	±0.1 mV*	<19.99 mS/cm: ±0.1%* >20.00 mS/cm: ±0.25%* Salinity ± 2 %*	±0.01 mg/l**	±0.1 %**	±0.1 °C*** ±0.18°F* ±0.1 K*
Temp. compensation	-5 ÷ 110 °C	-	-5 ÷ 70 °C	0 ÷ 40 °C	-	-
Input impedance	>10 ¹² Ω	>10 ¹² Ω	-	-	-	-
α coefficient	-	-	0.00 ÷ 10.00 % / °C	-	-	-
K constant	-	-	0.010 ÷ 20.000 cm ⁻¹	-	-	-
Resistivity	Range: 0.500 Ωcm ÷ 200 MΩcm, accuracy: ±2% of the measured value*					
Air pressure range	800 ÷ 1100 hPa, accuracy: ± 2 HPa					
Power	2 x AA 1.2 V rechargeable batteries, 5 V / 1000 mA micro USB power adapter					
Weight	260 g					
Dimensions (mm)	L=149 W=82 H=22					

* The accuracy of the meter only.

**The accuracy of the meter only. With COG-1 or COG-2 oxygen sensor the accuracy at calibration temperature: ±1 %.

By the difference ±5 °C accuracy: ± 3 %, by the difference ±10 °C accuracy: ±5 %.

***The accuracy of the meter only. The total error includes the meters and probe's accuracy. In the range 0 ÷ +100 °C the acceptable error of the probe with Pt-1000S resistor: ±0.27 °C.

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