

MULTIFUNCTION METER CX-705

CX-705 multifunction meter belongs to the newest generation of measuring equipment and enables very accurate measurements of:

1. pH;
2. redox potential (mV);
3. ion concentration;
4. conductivity of solution;
5. salinity calculated to NaCl, KCl or TDS;
6. resistivity of solution;
7. oxygen saturation in air (%) and dissolved oxygen concentration in water (% or mg/l);
8. atmospheric pressure;
9. temperature of air or solutions in °C, °F and K;
10. enables semi-automatic titration.

High technical level, accuracy and wide range of possibilities at an affordable price.

Characteristic features:

- Measurements in all functions are made with the highest accuracy.
- All operations are done with use of buttons generated on the 10" colour graphic backlit touch screen.
- Possibility of simultaneous measurements and observing results of all 7 functions displayed in numerical form.
- The chosen function may be displayed in graphic form.
- **CX-705** may be used in laboratory as well as in the field after placing it in a special case with rechargeable batteries (optional).
- The rechargeable batteries placed in the case allow for continuous work in the field for 8 – 15 hours (depending on the kind of the chosen measuring functions and the screen settings).
- Standardised operation procedure for all measuring functions facilitates working.
- Stabilised reading signalisation with the "READY" signal and sound.
- "HOLD" function to freeze the result on the display.
- Built-in sockets enable simultaneous measurements of pH, ions (or redox potential), conductivity and salinity, oxygen dissolved in water or oxygen saturation in air and temperature.
- The pH and temperature sockets are isolated from ion sockets; pH, temperature and ion sockets are isolated from oxygen and conductivity sockets.
- Pop up windows with additional information facilitate working.
- Possibility of creating and sending a calibration report to a computer – up to 10 last calibrations.
- Storing the upcoming calibration date.
- Except for working with power adapter the meter may be powered by an external rechargeable battery, what enables long-lasting measurements in the field conditions with use of special carrying case with batteries (optional) or during work in field measuring stations without power sources.

In the pH measuring function:

- pH electrode calibration in 1 ÷ 5 points.
- Automatic detection of pH buffers and standards, their value may be set by the user.
- Automatic correction of the pH standard solution value changes 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 replacing, very useful feature during field work.
- Automatic evaluation of the electrode's condition.
- Enables readout of the pH electrode parameters – buffer and slope.
- The pH and conductivity measuring circuits are isolated what enables accurate and error free simultaneous measurements in the same vessel.
- Depending on the chosen pH electrode kind possible measurements in pure water, sewage, pastes, etc. BNC-50 plug.

In the mV and redox potential measuring function:

- Precise Redox potential measurement (accuracy 0.1 mV).
- Possibility of mV measurement in relation to the set or measured reference potential (V_{ref}).

In the conductivity measuring mode:

- Full measuring range enables making measurements in ultra pure water as well as very salty saline.
- 6 sub-ranges switched automatically.
- In case of measurements of natural water with conductivity from 60 $\mu\text{S}/\text{cm}$ to 1 mS/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 has been improved by automatic adjustment of the α coefficient depending on the kind of trace contaminations and temperature.
- Calibration by entering the K constant in range 0.010 ÷ 20.000 cm^{-1} or in standard solutions in 1 to 5 points.
- Wide range of α coefficient 0 ÷ 10 %/ $^{\circ}\text{C}$, chosen depending on the measured solution.
- Possibility of entering K constants of 3 cells which cover the whole measuring range.
- Smooth change of the reference temperature value.
- Automatic calculation of conductivity into salinity in NaCl or KCl on the basis of the actual characteristics, what greatly improves the accuracy of conversion.
- Possibility to determine TDS with use of conductivity measurement by entering the TDS coefficient in range 0.2 ÷ 1.0.
- Possibility to measure electric admittance of tree seedlings – checking the vitality of seedlings with a special cell.
- Highly accurate **ECF-1** conductivity cell available as additional equipment. Measuring range: 0 ÷ 400 mS/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.
- Wide measuring range enables measurements in lakes and tanks with blooming vegetation.
- In case of oxygen measurements it is recommended to buy an accurate, easy in use and maintenance galvanic **COG-1** oxygen sensor.



In the atmospheric pressure measuring function:

- Possibility of continuous observation of atmospheric pressure value on the meter's screen.
- Possibility to choose the unit: hPa, Bar, mmHg.

In the Ion measuring function:

- Enables ion concentration measurements of monovalent, bivalent, negative and positive ions.
- The measuring range of the meter enables co-operation with all ion selective electrodes (ISE) chosen depending on the measured ion, equipped with BNC connector.
- Molar weight and valence of measured ion is automatically introduced.
- Possibility to choose the unit among pX, g/l, M/l, ppm.
- Automatic conversion of units – e.g. M/l to mg/l.
- Possibility of entering freely chosen standard solution value.
- A simultaneous measurement of pH and redox potential (ORP) or pH and ions possible, with use of separate connectors.

In the temperature measuring function:

- Possibility to choose the unit: °C, °F, K.
- Possibility to enter the selective sensor's group number what improves accuracy.

In the titration mode:

- Potentiometric, calorimetric and conductometric titration with automatic determining of the crucial values (e.g. endpoints).
- The only required operating procedure is entering the volume of the added titrator.
- The results of titration are collected as series of measurements with the endpoints marked.

Other features:

- Storage for up to 8000 readings collected in groups in the meter's internal memory.
- The readings of all currently measured functions are recorded simultaneously.
- Cooperation with a PC with use of USB connector, what enables transferring the current readings or the series collected in the meter's memory to the PC.
- Automatic or manual temperature compensation.
- The charts may be scaled both during the continuous observation and during the analysis of the collected readings, zoom function.
- The readings and calibration data are stored in non-volatile memory.
- Three languages: Polish, English and German.
- Internal clock with date.
- The meter meets the GLP requirements.
- IP64 ingress protection.
- 24 months of warranty.

The additional equipment should be chosen by the user depending on the predicted parameters which will be measured and type of measured solutions. The accessories are chosen individually. **EPS-1** pH electrode for clean water, **IJ44A** for waste water, pasts, semi solid samples, **EPX-4** for chemical compounds or **EPX-4U** for re-distilled water. For oxygen measurements **COG-1** and for conductivity **ECF-1**.

In standard set the **CT2S-121** temperature sensor with the **Pt-1000S** resistor added.

TECHNICAL DATA

Function	pH	mV	Conductivity / Salinity	O ₂ (mg/l)	O ₂ (%)	Temperature
Range	-6.000 ÷ 20.000 pH	±2000.0mV	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)	±0.001 pH*	±0.1 mV*	< 19.99 mS/cm ±0.1%* > 20 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 ÷ 20.000cm ⁻¹	-	-	-
Resistivity	Range: 0.500 Ωcm ÷ 200 MΩcm, accuracy: ±2% of the measured value					
Air pressure range	800 ÷ 1100 hPa, accuracy ±2 hPa					
Power	15V/1A power adapter or external rechargeable battery (optional)					
Weight	1400 g					
Dimensions (mm)	L= 322, W= 232, H= 34 / 30					

*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.

Ion selective measurements

Function	Ion (M/l)	Ion (g/l)	Ion (ppm)	Ion (pX)
Range	0 ÷ 100	0 ÷ 1000	0 ÷ 1 000 000	-2.00 ÷ 16.00
Accuracy (± 1 digit)	± 0.25%	± 0.25%	± 0.25%	± 0.002 pX
Temp. compensation	-5 ÷ 110 °C	-5 ÷ 110 °C	-5 ÷ 110 °C	-5 ÷ 110 °C
Resolution	0.01 / 0.1%	0.01 / 0.1%	0.01 / 0.1%	0.001 / 0.01 pX

*The accuracy of the meter only.



The case set for CX-705 for the field work

The meter is placed firmly in the case. The accessories – electrodes, probes, cells and power adapter - may be put sideways in the case.

The rechargeable batteries are placed in the upper side, they may be charged without taking them out of the case.

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