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COMBI 5000 in various configurations

Information

The COMBI 5000 is an universal instrument for the immediate measurement of the most important parameters in plant production. With the COMBI 5000 hand-held measuring instrument the growth-relevant parameters such as pH value, EC value, activity (salinity in substrate/soil), temperature, soil Moisture, humidity and air pressure can be determined quickly and accurately.

All measurements can be carried out both in the (nutrient) solution and/or soil suspension but also directly in the soil or substrate. This way, the plant producer can detect a deficiency or surplus of nutrients at an early stage and react in a targeted manner to ensure the good development of the crop.

The COMBI 5000 works with automatic sensor recognition and automatically changes to the appropriate measuring mode each time the electrode is being changed. This makes working with the instrument much more intuitive and virtually eliminates application errors due to incorrect menu settings. The automatic calibration of the COMBI 5000 offers a further safety feature: The instrument automatically recognizes all required pH and conductivity standard solutions and adjusts itself automatically to the specified value.

With the COMBI 5000 App you can easily digitize all COMBI 5000 measured values. The evaluation via App guarantees quick and easy storage and interpretation of all measured values for different cultures.

pH measurement

The COMBI 5000 is a perfect tool to provide information about the plant nutrition status for professional plant producers and consultants all over the world due to the multi-lingual menu navigation (D, GB, RUS). The COMBI 5000 takes the predicate “Made in Germany” and the associated high quality standards into account in every way.

Features:

- Universally applicable: Wide range of probes for monitoring nutritional status of your plants.
- No application errors: The latest microprocessor technology enables automatic sensor detection: each time the probe is changed, the instrument automatically switches to the corresponding measuring mode.
- Easy-to-use: The automatic buffer recognition during calibration also ensures a high level of operating convenience and additional safety.
- Fast on: Simply exchange probes during the measurement without a re-start.

- Saves time: Simultaneous measurement of different parameters.
- Always ready to go: The unit is delivered in a sturdy aluminium case, with all accessories stored safely and within reach.
- Multilingual: Easy to understand menu is available in three languages: German, English and Russian.
- Smart: Evaluation via the COMBI 5000 app provides quick and easy storage and interpretation of all measured values for different plants.

pH probe

Functions

pH measurement

pH is one of the most important parameters in the plant nutrition. The absorption of nutrients by the plants is highly dependent on pH. For this reason, fast, easy and accurate pH measurements are essential in professional horticulture.

EC measurement

Electrical conductivity of an aqueous solution is directly related to the concentration of the dissolved salts. For plant nutrition control, it is essential to measure EC of process water and nutrient solution, especially in closed and hydroponic cultivation.

Activity measurement (salinity)

Salinity is determined by the concentration of total dissolved salts directly in the soil or substrate, taking into consideration the relevant soil properties, like soil moisture, temperature and soil compaction. These factors determine the quantity of salts being “active” and available to the plants.

Moisture measurement

The measuring principle is based on the FDR measuring technology and is not affected by pH and salt content of the soil and substrates. Water content data (expressed in Vol %) allow immediate statement about the irrigation water requirements.

Soil temperature measurement

Temperature measurement is carried out in the range of -10°C to +50°C by a fast-reacting NTC sensor spattered in the probe tip.

Air temperature, humidity and air pressure measurement

The HPT probe enables simultaneous measurement of air temperature, humidity and air pressure. The integrated sensor technology is highly precise and has a very fast response time. Like all COMBI 5000 sensors, the air temperature and humidity sensor is automatically recognised by a special coding as soon as it is connected to the basic unit. The HPT sensor is especially important in greenhouse cultivation with ventilation and shading installations. The extension of the control possibilities of the growing conditions by measuring air temperature and humidity is a further step in the development of a fully comprehensive multifunctional control system in professional plant production.

Data logger function

The basic unit has an integrated data logger that records all measurements of the instrument. With the help of the data transmission cable, all data stored in the unit (parameters and

measured values with date and time) can be transferred to PC. The data transfer protocol is displayed in .csv data format and can be easily transferred to an Excel file, for example.

EC measurement

Probes and features:

- **pH probe**
 - direct measurement in soils, substrates and liquids
- **EC probe**
 - conductivity measurement in liquids, e.g. nutrient and stock solutions
- **Multi-probe** for simultaneous measurement of:
 - activity measurement (salinity)
 - soil moisture (volumetric)
 - temperature
- **HPT probe** for simultaneous measurement of:
 - humidity
 - air temperature
 - air pressure
- **Data logger function** with data export option

EC probe

Recommended applications:

- Nurseries: container plants, particularly if slow-release fertilizers are applied
- Landscape: golf course greens, sports grounds, etc.
- Peat production for immediate check during production process
- Compost plants: to avoid excess of salt concentration in compost soils
- Communities, local governments: determination of soils charged with chloride after winter period
- Consultants, advisors, salesmen, etc.
- Universities, schools, horti- and agricultural educational institutes
- Pot plant production: control of nutrient solutions (fertilizer mixing systems), stock solutions
- Substrate production: salinity control of peat and cocopeat products
- Hydroponic systems, growing media like rockwool, etc.
- Laboratory use as universal pH and EC-meter

Measurement of activity (salinity), soil moisture and temperature

Technical Specifications

Technical data:

- Housing: splash-proof, rugged
- Connector: BNC plug and 8-pin-plug
- Power: > 4000 measurements, 9-Volt-battery
- Display: alphanumeric, reflective
- Automatic switch-off: after 4 minutes
- Dimensions: 180 × 83 × 55 mm
- Weight: 300 g
- Data logger function (optional): memory: ca. 2,620 measuring values / measuring rate: 1 min – 24 h

pH measurement

- Measuring range: 0 – 14 pH
- Resolution: 0.01 pH
- Accuracy: 0.02 pH
- Calibration: automatic at pH 4, pH 7. Additionally at pH 10 if required
- Probe: gel-filled insertion probe
- Probe length: 125 mm
- Connector: BNC plug
- Application: pH measurement directly in soils / substrates and in liquids

EC measurement

- Measuring range: 0 – 200 mS
- Resolution: 0.001 – 0.01 mS
- Accuracy: ± 2 % from measured value
- Calibration: automatic
- Probe: plastic with platinum sensors
- Probe length: 125 mm
- Connector: 8-pin plug
- Application: conductivity measurement in liquids, e.g. nutrient and stock solutions

Measurement of humidity, temperature and air pressure

Multi-probe

- Probe: PVC, Ø 10 mm
- Probe length: 250 mm
- Sensors: FDR capacitive (moisture), NTC (temperature), bi-pol (salinity)
- Temperature compensation: automatic
- Connector: 8-pin plug
- Applications: measurement of salinity, temperature, soil and substrate moisture
 - Activity measurement (salinity):*
 - Measuring range: 0 – 2.99 g/l of active salts
 - Resolution: 0.01 g/l of active salts
 - Calibration: factory calibration, stable
 - Temperature measurement:*
 - Measuring range: – 10 to +50°C
 - Resolution: 0.1°C
 - Moisture measurement:*
 - Measuring range: 0.5% to 60%VWC
 - Resolution: 0.1
 - Calibration: 0: in air and 60%VWC: in water

HTP probe (humidity – temperature – air pressure)

- Measuring range: 10 ... 100 rH% / * 260 ... 1260 hPa / – 20 ... +80 °C
- Resolution: 0.1 rH% / 0.1 hPa / 0.1 °C
- Accuracy: 2% / 0.5 hPa / ±0.2%
- Calibration: factory calibration
- Connector: 8-pin plug

AM probe

- Measuring range: 0 – 2.99 activity in g/l
- Resolution: 0.01 activity in g/l
- Calibration: factory calibration, stable
- Probe: stainless steel with special 2-pol-sensor
- Probe length: 250, 500 or 750 mm
- Connector: 8-pin plug
- Application: direct measurement of soil salinity

Soil moisture probe

- Measuring range: 0 – 60 %VWC / -40 to +60°C
- Accuracy: ± 3% / ± 0.5°C
- Resolution: 0.1% / 0.1°C

- Connector: 8-pin plug
- Dimensions: H = 150 mm, Ø 60 mm
- Application: moisture and temperature measurement directly in the soil or substrate

Data logger function

- Measuring rate: 1 min – 24 h
- Memory: ca. 2,620 measuring values