YP-GT7 High-Intelligence Soil Nutrient Analysis System

(This model is a new-generation multifunctional soil detector, a bidding product for various research institutes, universities, vocational colleges, etc.)

**I. Product Introduction of Multi-Parameter Soil Environment Analysis and Detection System:

**Fully Equipped:

** This instrument integrates chemicals, tools, and the apparatus into one unit. It is portable, equivalent to a small mobile laboratory. Users do not need to prepare additional attachments, and it allows for flexible field testing. It is suitable for agricultural service departments or agricultural material distributors, higher education institutions, research institutes, cooperatives, fertilizer manufacturers, and large-scale growers for soil testing and fertilization, identifying genuine and fake fertilizers, and environmental protection testing applications.

Comprehensive Detection Functions: The test items cover a wide range both domestically and internationally. In addition to standard reagents, various other chemicals can be added and purchased as needed.

Simple Operation and Fast Speed: It comes with a complete set of attachments and ready-to-use finished reagents, requiring no preparation.

Reliable Performance: Operational stability is six times better than the national standard JJG179-90 indicator, with repeatability reaching the level of grating-type spectrophotometer

indicators.

II. Multiple Functions and Comprehensive Test Items:

1. Soil Nutrients:

* **Basic Nutrients:** Soil Ammonium Nitrogen, Soil Available Phosphorus, Soil Available Potassium, Soil Nitrate Nitrogen, Soil Hydrolyzable Nitrogen, Soil Total Nitrogen, Soil Total Phosphorus, Soil Total Potassium, Soil Organic Matter (Tyurin Method), Soil Organic Matter (Extraction Method), Soil Total Organic Carbon, Soil Carbon-to-Nitrogen Ratio, pH Value, Salt Content, Moisture.

* **Soil Medium and Trace Elements:** Soil Calcium, Soil Magnesium, Soil Sulfur, Soil Silicon, Soil Boron, Soil Iron, Soil Copper, Soil Manganese, Soil Zinc, Soil Chlorine, Soil Molybdenum.

* **Soil Heavy Metals:** Soil Lead, Soil Arsenic, Soil Cadmium, Soil Chromium, Soil Mercury, Soil Nickel, Soil Aluminum, Soil Fluorine, Soil Titanium, Soil Selenium.

2. Environmental Factors:

* Soil Volumetric Water Content, Soil Temperature, Soil Electrical Conductivity, Air Temperature, Air Humidity, Dew Point, Atmospheric Pressure, Illuminance, Carbon Dioxide.

3. Fertilizer Nutrients:

* **Single Fertilizer:** Ammonium Nitrogen in Nitrogen Fertilizers, Nitrate Nitrogen in Fertilizers, Urea Nitrogen, Biuret, Phosphorus in Phosphate Fertilizers, Water-Soluble Phosphorus in Phosphate Fertilizers, Potassium in Potash Fertilizers.

* **Compound Fertilizer:

** Total Nitrogen, Total Phosphorus, Total Potassium.

* **Organic Fertilizer:** Total Nitrogen, Total Phosphorus, Total Potassium, Nitrate Nitrogen, Available Phosphorus, Available Potassium, Acid-Hydrolyzable Nitrogen, Organic Matter.

* **Humic Acid:

** Water-Soluble Humic Acid (Weathered Coal), Water-Soluble Humic Acid (Lignite), Water-Soluble Humic Acid (Peat), Free Humic Acid (Weathered Coal), Free Humic Acid (Lignite), Free Humic Acid (Peat).

* **Water-Soluble Fertilizer:

** Total Nitrogen, Total Phosphorus, Total Potassium.

* **Foliar Fertilizer:

** Total Nitrogen, Total Phosphorus, Total Potassium.

* **Various Fertilizer Trace Elements:

** Fertilizer Calcium, Fertilizer Magnesium, Fertilizer Sulfur, Fertilizer Silicon, Fertilizer Boron, Fertilizer Iron, Fertilizer Copper, Fertilizer Manganese, Fertilizer Zinc, Fertilizer Chlorine, Fertilizer Molybdenum.

* **Fertilizer Heavy Metals:** Fertilizer Lead, Fertilizer Arsenic, Fertilizer Cadmium, Fertilizer Chromium, Fertilizer Mercury, Fertilizer Nickel, Fertilizer Aluminum, Fertilizer Fluorine, Fertilizer Titanium, Fertilizer Selenium.

4. Fresh Crop Nutrition:

* Crop Nitrate Nitrogen, Crop Ammonium Nitrogen, Crop Phosphorus, Crop Potassium.

* **Crop Medium and Trace Elements:** Crop Calcium, Crop Magnesium, Crop Sulfur, Crop Silicon, Crop Boron, Crop Iron, Crop Copper, Crop Manganese, Crop Zinc, Crop Chlorine, Crop Molybdenum.

* Crop Nitrate, Nitrite.

5. Dry Plant Nutrition:

* Plant Total Nitrogen, Plant Total Phosphorus, Plant Total Potassium.

6. Tobacco Leaf Nutrition:

* 20 items including Total Nitrogen, Total Phosphorus, Total Potassium, Reducing Sugar, Water-Soluble Total Sugar, Boron, Manganese, Iron, Copper, Calcium, Magnesium, etc.

7. Food (Fruits, Vegetables, etc.):

* Nitrate, Nitrite, Heavy Metals (Lead, Chromium, Cadmium, Arsenic, Mercury), etc.

8. In Water Quality:

* Ammonium Nitrogen, Phosphorus in Water, Potassium in Water, Nitrate, Nitrite, Hardness, pH, Iron, Copper, Manganese, Zinc, Boron, Chlorine, Sulfur, Silicon, Molybdenum, etc.

III. Testing Efficiency:

* Simultaneous extraction and determination of multiple nutrients such as available N, P, K in soil at one time (Draftsman of the Ministry of Agriculture's rapid testing industry standard).

* Simultaneous, rapid, and accurate detection of nutrients such as Nitrogen (N), Phosphorus (P), Potassium (K) in fertilizers.

* **Testing Speed:** Under normal proficiency:

* Testing one soil sample (N, P, K) for three items takes 20 minutes (including reagent preparation and soil sample pretreatment time).

* Simultaneously testing three soil samples (N, P, K) $\leqslant$ 40 minutes.

* Simultaneously testing eight soil samples ≤ 1 hour.

* Testing one fertilizer sample (N, P, K) ≤ 50 minutes.

* Simultaneously testing three fertilizer samples (N, P, K) ≤ 1.5 hours.

IV. Testing Error:

* Soil N, P, K error ≤ 1%, organic matter error ≤ 2%, relative error of trace elements ≤ 5%.

* Single fertilizer item error ≤ 0.5%, three-item N, P, K error ≤ 1%.

* Relative error of heavy metals ≤ 5%.

V. Functional Features:

1. Android intelligent operating system, main control chip uses ARM Cortex-A7, RK3288/4-core processor, main frequency 1.88Ghz, faster operation speed, stronger stability.

2.

★ **Precision Rotating Cuvette Design (Patent No.: ZL201821777724.7)**, ensuring more precise light source consistency and detection accuracy.

3.

★ **12 Rotating Detection Channels**, can quickly detect 12 samples at once, greatly improving detection efficiency and reducing detection costs.

4. Uses self-developed patent analysis method with high-precision filter technology (Patent No.: ZL202021763837.9), authoritative certification.

5. Built-in calibration function during detection, intelligent constant current voltage stabilization, automatic light intensity calibration, ensuring detection accuracy, obtained "Calibration Certificate" from the National Institute of Metrology, China.

6.

★ **Built-in Aviation Interface for Sensors**, easy plug-and-play, equipped with FDR sensor and Multi-Element Environment Sensor.

7.

★ **FDR Sensor** is a 3-in-1 soil sensor, simultaneously measuring Soil Moisture Content, Soil Temperature, and Soil Electrical Conductivity (Salinity) conveniently and quickly.

8.

★ **Multi-Element Environment Sensor** is a 6-in-1 sensor, simultaneously measuring Air Temperature, Air Humidity, Dew Point, Atmospheric Pressure, Illuminance, and Carbon Dioxide.

9. Instrument standard includes WiFi wireless upload, 4G network transmission, GPRS wireless remote transmission for fast data upload.

10. Equipped with a smart cloud agriculture platform. After connecting to a wireless network, detection data can be selectively or batch uploaded wirelessly, facilitating long-term data management and visual analysis for users.

11. The instrument also has USB interface, Ethernet interface, built-in large-capacity memory, and data can be copied via USB drive at any time.

12. Mobile phone can log into the cloud platform at any time for online mobile viewing of historical data.

13. Built-in crop expert fertilization system, can calculate recommended fertilization amounts for target yields of over a hundred national agricultural cash crops, fruit trees, etc., guiding agricultural production scientifically based on fertilization formulas. Soil testing and formula fertilization results can be printed, including: crop type, fertilizer type, target yield, total demand, recommended fertilization plan.

14. Built-in plant nutrition diagnostic standard atlas, comparing leaf surfaces based on pictures of nutrient deficiencies in various crops to diagnose sufficiency or deficiency.

15. 4-wavelength professional testing cold light source (red, blue, green, orange), stable light source wavelength, no thermal drift during long-term continuous operation, service life up to 100,000 hours, good reproducibility, high accuracy.

16. The colorimetric cell part uses a standard 1cm cuvette, no mechanical displacement or wear, precise optical path testing positioning, effectively shielding external light interference, ensuring test results exceed national standard requirements.

17. The instrument system includes sample pretreatment operation videos. Clicking the video module allows viewing of various sample testing methods. Testing personnel do not need to self-study the manual; guidance and teaching are convenient and fast, facilitating quick operation
for beginners.

18. Built-in new generation high-speed thermal printer (no ribbon required), print content includes: testing unit, testing personnel, testing items, channel number, absorbance, nutrient
content (mg/kg), testing time, and QR code, etc.

19. High-sensitivity 7-inch true color touch screen, more efficient and user-friendly operation, high-definition and high-interaction display, greatly reducing the cumbersome operation and errors of traditional instruments, and has obtained multiple "Software Copyrights".

20. Built-in clock function, convenient for operation time recording and long-term historical traceability.

21. Supports multi-account login with passwords, efficient UI interface, different users can freely add and edit detection information, which can be saved for long-term use.

22. GPS function: Can record longitude and latitude locations during field operations, meeting special user needs.

23. Built-in low voltage prompt function, can clearly indicate battery level during detection to avoid test data deviation. Also has power-off protection function, automatically saves data upon power loss to prevent data loss.

24. AC/DC dual power supply mode, built-in large-capacity rechargeable lithium battery, can work continuously for over 10 hours when fully charged, and can also be connected to a vehicle power source for charging.

25. The instrument has Chinese/English switching function, meeting export requirements.

26. High-strength PVC engineering plastic suitcase design, sturdy and durable, easy to carry.

VI. Technical Parameters:

1. **Power Supply:** AC 220±22V DC 12V+5V (The instrument has a built-in lithium battery and can also use a vehicle power source)

2. **Power:** ≤5W

3. **Range and Resolution:** 0.001-9999

4. **Repeatability Error:** ≤0.02% (0.0002, potassium dichromate solution)

5.

Instrument Stability: No digital drift within one hour (transmittance measurement); digital drift does not exceed 0.3% (0.003, transmittance measurement) or 0.001 (absorbance measurement) within two hours.

6. **Linearity Error:** ≤0.1% (0.001, copper sulfate detection)

7. **Sensitivity:** Red light ≥4.5×10^{-5}, Blue light ≥3.17×10^{-3}, Green light ≥2.35×10^{-3}, Orange light ≥2.13×10^{-3}

8. **Wavelength Range:** Red light: 680±2nm; Blue light: 420±2nm; Green light: 510±2nm; Orange light: 590±4nm

9. **pH Value:** (1) Test Range: 1～14 (2) Accuracy: 0.01 (3) Error: ±0.1

10. **Salt Content:** (1) Test Range: 0.01%～1.00% (2) Relative Error: ±5%

11. **Soil Moisture Parameters:** Moisture Unit: % (g/100g); Moisture Content Test Range:

0-100%; Error <0.5%

12. **Soil Temperature:** Range: -40 to 120° C; Measurement Accuracy: ±0.2° C; Resolution:

±0.1° C

13. **Soil Electrical Conductivity:** Range: 0-20 mS/cm; Measurement Accuracy: ± 2%;

Resolution: ±0.1 mS/cm

14. **Temperature Range:** -40° C to +125° C; Accuracy: ±0.3° C

15. **Humidity Range:** 0%RH to 100%RH; Accuracy: ±3%RH

16. **Dew Point Range:** -20 to +50° C; Accuracy: ±0.5° C

17. **Atmospheric Pressure Range:** 300 to 110 kPa (Altitude 9000m to -500m); Accuracy: 0.06 hPa (0.5m)

18. **Illuminance Range:** 0-200,000 Lux; Accuracy: 0.054 Lux

19. **CO2 Range:** 0-5000 ppm; Accuracy: 50 ppm

20. **Shockproof Rating:** IP65

21. **Instrument Dimensions:** 48×34.5×22 cm

22. **Net Weight of Main Unit:** 5.2 kg

23. **Packaging Dimensions:** 510×390×375 mm

24. **Packaging Weight:** 11.5 kg

VII. After-Sales Service:

* The instrument has a five-year warranty for the whole machine, lifetime free maintenance service, free mailing of the instrument, and free training.

* Lifetime free provision of agricultural technical support related to soil and fertilizer, etc.