

# **Whiteness Analyzer**

**WSB-V**

## **User Manual**

**Please read this manual carefully before use.**

## 1. Introduction

Whiteness Analyzer is used for measuring the surface blue light whiteness of different objects, the measure result is digital displayed and could be printed out by the inner printer. The Analyzer is easy to operate and has a high measurement precision. It could be used for the whiteness measurement of different materials and industries, e.g. flour, amylum, rice flour, salt, textile, printing and dyeing, chemical fiber, plastic, porcelain clay, talcum powder, white cement, dope, paint, china, ceramic, porcelain enamel, paper sheet, paper pulp.

## 2. Technical index

- 1) Upright detection manner of diffuse reflection illuminance (d/o). The instrument is in accordance with GB3978-83: Standard illuminance system and illuminance observation conditions, simulating the D65 illuminance system, taking advantage of the geometric observation condition of d/o illumination, diameter of diffuse reflection ball is 120mm, diameter of the measure hole is 20mm, to eliminate the influence of sample mirror reflection, a light absorber is set inside.
- 2) Repeatability:  $\leq 0.1$
- 3) Indication drift:  $\leq 0.1$
- 4) Zero drift:  $\leq 0.1$
- 5) Indication error:  $\leq 0.5$
- 6) Output style: digital display.
- 7) Ambient condition: temperature: (0-40) °C, relative humidity:  $< 80\%RH$
- 8) Power supply: 0.2A AC (220+22) V, 50Hz

## 3. Principle

The instrument achieves the absolute spectrum diffuse reflection measurement by the integral ball. The optic principle is shown in Figure 1. Light was emitted from halogen tungsten light (1), the beam turn to blue purple light through the light aggregation mirror(2) and the light sieve sheet(3), then the light which entered the integral ball(4) would be diffuse reflected by the inner wall and irradiated on the sample in the examination hole(5), through the light aggregation mirror(6), light column(7) and the light sieve sheet group (8), the light which is reflected by the sample would be absorbed by the silicon photocell (9) and be turned to electric signal. The fundus signal of the integral ball was absorbed by the other line of silicon electric eye. Two lines of electric signal would be amplified separately and treated at the same time. The measure result would be digital displayed, and could be printed by the inner printer.

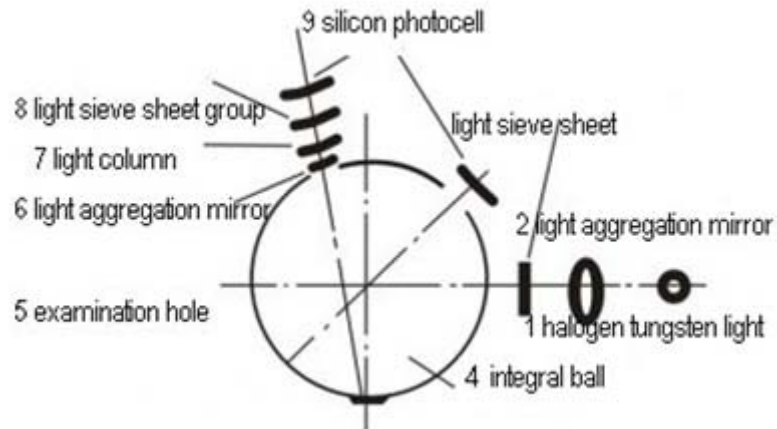


Figure 1

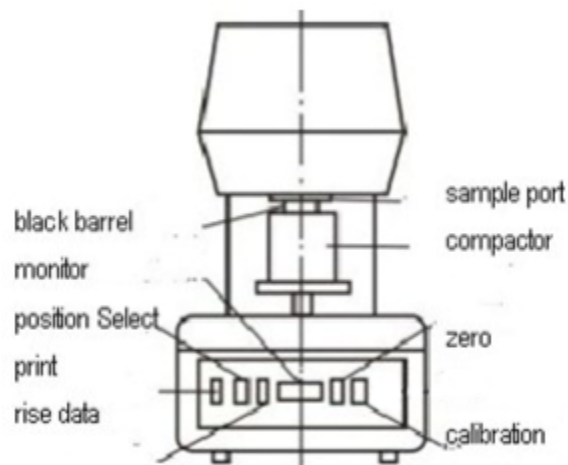


Figure 2

## 4. Operation

See figure 2 for the instrument face figure. Buttons on the right side are parallel connected.

- 1) Turn on the power, the displayed digit will discount from 120.0. After 2 minutes, the back side standard value of the standard white board will be displayed.
- 2) Put the black canister into the sample hole, press zero correction, the screen display will be "0.0" after 3 seconds.
- 3) Take the black canister away, put the white board into the sample hole and press calibration, the standard whiteness value will be displayed.
- 4) Put the being measured object in the sample hole, press measure, the whiteness value of the object will be displayed in 3 seconds.

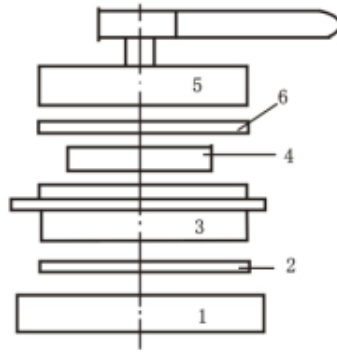


Figure 3

- 5) Measurement of powder samples(see figure 3), clean the power powder box with a clean brush, put some ground glass(2) into the press cover (1), revolve the powder plate(3) tightly, put the being measured sample into the powder box and move the extra powder which is above level, set the press piece(4), revolve the powder presser(5), revolve the handle clockwise, the sample is considered to be tightly pressed after the appearance of "TATA" sound, after that, revolve the handle anticlockwise by 720°, revolve the powder presser out and take out the press piece. Cover the plastic bottom cover(6), turn the powder box, revolve the press cover off, uncover the ground glass, put the powder box into the sample hole, press test, the whiteness value of the object will be displayed in 3 seconds.
- 6) Press print; the current whiteness would be printed out. Cut the print paper to the shape of oblique edge and insert the paper into the paper entrance, press the printer continuously until the paper come out.  
When the white work board is not in accordance with the instrument attached white board, calibrate the instrument by step 5.7 and 5.8.
- 7) Digit selection: Press digit selection, one digit of the three digit monitor would be brighter, press digit selection again, the brighter digit would move to the left.
- 8) Value rise: press value rise, a brighter value will be rising, press value rise continuously till it match the requirement. When the displayed value is in accordance with the back side value of white board, put the white board into the sample hole, then press calibration, the whiteness value of the white work board will be displayed in 3 seconds.

#### 9) Operation flow

Boot-strap → 2 minutes later → fix the black canister → press zero calibration → after 3 seconds → fetch off the black canister, fix the standard white board → press calibration → 3 seconds later → fetch off the white board, fill the sample → press measure → sample whiteness displayed in 3 seconds.

## 5. Attentions

- 5.1 The working environment of the analyzer should be dry and tidy, the work table should be level up and stable.
- 5.2 The instrument should be properly grounded to ensure safety.
- 5.3 When the surface layer of the halogen tungsten lamp turns black or white, it should be replaced, during replacing, unscrew the 4 bolts on the back of the instrument, then unscrew the 2 bolts on the upper side of the lamp holder, take away the old bulb and insert the new bulb in, the lamp filament should face with the center of the light aggregation mirror which is on the right front side of the lamp.
- 5.4 Replacement of the fuse: Undrawn the locket under the power socket, there are two fuses, take away the one inside and replace it with the one outside.
- 5.5 Keep the white work board clean, and prevent it from being sculled, if there were smutch on its surface, dip some anhydrous ethanol in the absorbent cotton, wipe the board with the cotton and use the board after it was dry.
- 5.6 Place the black canister conversely after use to prevent the entry of foreign matters.

## 6. Problems and solutions

Phenomenon	Reason	Solution
Unstablensess of measure result	Bulb broken/voltage Socket abnormal/no ground wire	Replace the bulb/check the power Replace the socket/add the ground wire
Continuously displaying "0"	Not zero calibrated	Fix the black canister and press zero calibration
Continuously displaying "1"	Not calibrated	Fix the white board and press calibration
Continuously displaying "2"	The set standard value is <10	Set the right standard value and restart
Continuously displaying "3"	The white board is mistaken as black board	Fix the black canister and press zero calibration
Continuously displaying "4"	Bulb broken	Replace the bulb
Continuously displaying "5" or "6"	Other staff was mistaken as white board	Fix the white board and press calibration

## 7. Accessory

Name	Quantity
Whiteness Analyzer	1
Black canister (press on the sample hole)	1
Accessories box (Powder presser, Powder box, block press, Plastic cover)	1
White work board	1
Power line	1
User manual	1