Operating instruction for Water Activity Detector

I. Installation

1. The plug of WSC-4 water activity sensor into the sensor receptacle of the back panel of the instrument. The plug of the sensor is push-pull type, and shall be pushed by aiming at the receptacle notch.
2. The power line and signal control line of the printer shall be separately connected to the power terminal and signal control receptacle of the printer at the back panel of the instrument.
3. Connect the power line of the instrument, and please confirm that the power switch of the instrument is in “off” state before the power is connected. Note: good grounding shall be provided for the power.

II. Use

1. Functions of keyboard

Selection key: mainly used to select the item needing implementation;

Confirmation key: mainly used to implement the selected item;

Increase/decrease key: mainly used to adjust time and measurement time

2. Operation

Before the power is connected, the instrument must be placed at the use environment for above 30 min. Turn on the power switch and the power switch of the printer, and the instrument display will show three optional functions (“measurement”, “correction” and “setting”) and current time in the homepage. User can select functions with the “selection” key according to needs (the selected item No. will be shown in highlighted black).

a. Measurement: First, put the object needing measurement into glassware (the object needing measurement shall be cut up as possible, and it shall account for 50%～80% of the volume of the glassware. During measurement, the glassware must not be covered with cover glass.), then put the glassware into water activity sensor and make the sensor covered. Select the measurement function and press “confirmation” key, then the water activity detector will be in measuring status. The measurement time shall be 10～30 min (settable). During measurement, the options of water activity, temperature, measurement time and printing will be indicated. The printing option includes printing (printing after the measurement is completed or press “confirmation” key to print the real time data during measurement”), no printing and stop measurement, and this option can be selected with the “selection” key. After the measurement is completed, the instrument will indicate and

print the final measuring results. At this time, the “confirmation” key can be pressed to return to the homepage, so as to prepare for next measurement.

Due to the tightness of the water activity sensor, the upper cover and base of the water activity sensor shall be placed staggeredly after use.

If the water activity of the object needing measurement is ≥0.95, drying agent (such as silica gel self indicator) shall be put into the sensor immediately upon completion of the measurement, and the sensor shall sealed for above 4 h.

b. Correction: This function is set for correcting the measurement precision of the instrument. Generally speaking, the instrument shall be corrected once for each two weeks if the use environment has no obvious change. Note: correction must be performed before the first use!

Select the correction function and press “confirmation” key to enter the menu of next page. In this page, two kinds of saturated salt for correction are indicated. After the proper saturated salt is selected, put the glassware containing prepared saturated salt solution into the water activity sensor (the glassware must not be covered with the cover glass during correction), and cover the sensor. Then press the “confirmation” key, and the instrument will be in correction status, and perform automatic correction for the measurement precision of the instrument. During correction, the water activity, temperature, correction time and a functional option of stopping correction will be indicated. After the correction is completed, press the “confirmation” key to return to the homepage. If the correction process needs to be stopped, the “confirmation” key can be pressed.

If the predicted water activity of the object needing measurement is above 0.40, then sodium chloride solution shall be used for correction; and if the predicted water activity of the object needing measurement is below 0.40, then magnesium chloride shall be used for correction.

c. Setting: If the relevant parameters need to be set, the “setting” function shall be selected, and select time and measuring time with the “selection” key after the “confirmation” key is pressed. Then, use “▲” and “▼” to set time (year, month, day, h, min) and measuring time after confirmation. After the setting is completed, press “confirmation” key to return to the setting page, or select “return” to return to homepage after confirmation. The measuring time, which is the time needed for water activity sensor to reach balance, is mainly set for adjusting to different materials need measurement. Proposal: please properly prolong the measuring time when the temperature is below 20℃.

III. Preparation of Saturated Salt Solution

The saturated salt solution is used for instrument correction in the form of

fixed point of water activity. These fixed points of water activity represent the constant water activity of different saturated salt solution under certain temperature. Two kinds of saturated salt solution are used as the correction standard for the instrument. The specific preparation method is as below:

The saturated salt solution is prepared with salt (AR) (such as AR sodium chloride and AR magnesium chloride) and pure water or distilled water. The liquid part of the prepared saturated salt solution shall cover the undissolved AR salt (indication: about 15 g AR sodium chloride and 10 g water can be used to prepare the saturated sodium chloride solution, and about 18 g AR magnesium chloride and 3～4 g water can be used to prepare the saturated magnesium chloride solution). To obtain uniform salt solution, the pure water or distilled water, the temperature of which is a little higher than ambient temperature, shall be added when the AR salt solution is prepared. Then, the saturated salt solution shall be placed under normal temperature after it is covered, and it only can be used 12 hours after it reaches the ambient temperature. Since the water activity has close relationship with ambient temperature, there are certain requirements to the stability of the saturated salt solution to temperature. Considering the thermal inertia of the saturated solution, sudden change of temperature shall be avoided.

IV. Notes

1. Good grounding shall be provided for the instrument.
2. It is forbidden to measure the materials whose water activity is above 0.98 (such as water).
3. Please do not touch the shell of water activity sensor when the instrument is used. The sensor shall not be opened during measurement or correction, or the veracity of measurement will be affected.
4. If the sensor will not be used in a long term, drying agent shall be put into it, so as to make the inner of the senor in a stable and safe environment.
5. Direct solar radiation shall be avoided. The instrument shall be stored and used in a cool and ventilated place.

V. General Troubleshooting

If the instrument for patrol measurement works abnormally, it shall be turned off immediately. Then, check if the connection of the water activity detector is normal and if there is condensation inside the sensor, and pull it out and plug it again. Turn on the instrument again. If it still works abnormally, please contact our company.