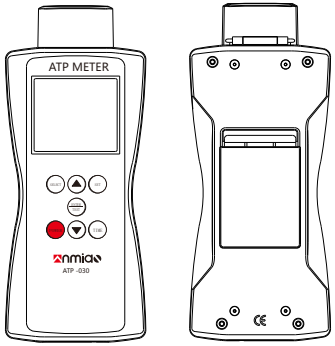
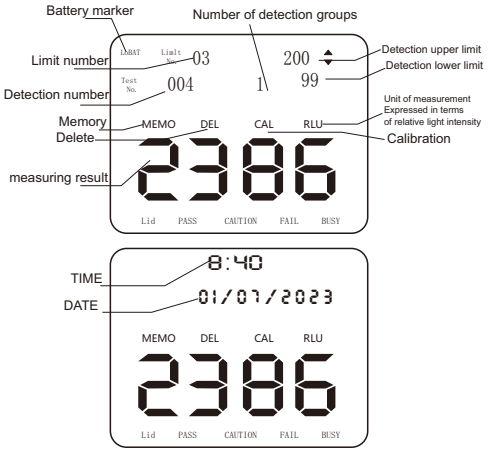
ATP fluorescence detector manual

ATP-030



Rear cover: For mounting 2*5 batteries.
Data interface: Data can be transmitted to PC through data line.

3.Display



1.Operating principles

1.operation principle

ATP bioluminescence detector uses biochemical luminescence technology to turn the invisible ATP concentration into visible light output, so as to indirectly display the number of microorganisms with quantitative results. The value is between 0 and 9999, expressed in relative light unit RLUs. Although RLU is not an actual unit of light intensity, it can provide a realistic detection method for ATP biochemical luminescence detection. So 1RLU is equal to 1fmol of ATP

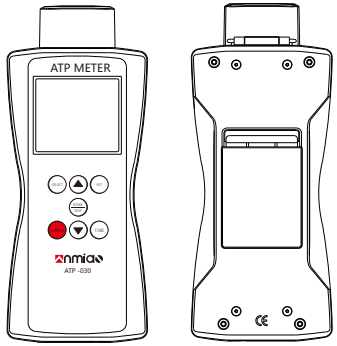
RLU readings can be compared with a user set limit range to provide a comprehensive result limit, namely pass PASS warning CAUTION Or not FAIL. In order to ensure that you can get timely and accurate test results when using ATP bioluminescence detection system, please pay attention to the following:
Please read the user manual carefully before use. ATP bioluminescence detector must be used together with ATP fluorescence sampling stick.

4.Basic operation

The following provides the most basic daily operation of the instrument:
4.1 Boot Up:
Press the switch button POWER to turn it on. The instrument beeps once and displays power on Graphics. The instrument then performs a 30-second internal calibration procedure. Tip: If the clock is not set (such as after replacing the battery), the meter After the device is turned on, first enter the time and date setting mode and set The clock is executed only after its calibration procedure. See time and date SettingsChapter Five.
4.2 Internal Calibration：
After turning on, the instrument performs a 30-second internal

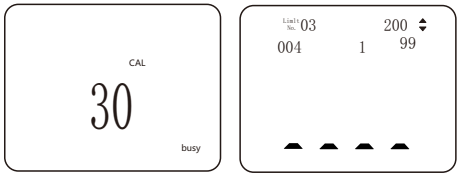
2. before use

Please read the user manual carefully before using the instrument to master the system composition and use method. Please confirm whether the product you purchased is complete according to the component content specified by ATP fluorescence detection system.



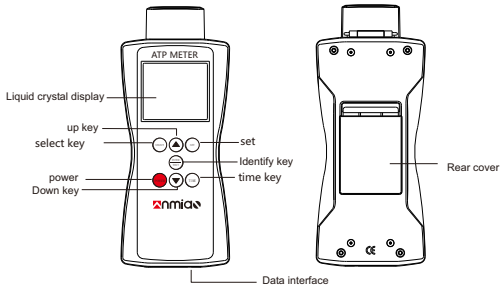
The host The battery cable

calibration check, digital Display counting backwards from 30 to 0:



Tip: Do not insert swabs while the instrument is being internally calibrated, and ensure that the upper cover is tightly covered.
The instrument automatically performs an internal calibration procedure (CAL mark flashing) under the following conditions:The instrument has been working continuously for a long period of time (generally more than 30 minutes);The instrument operates in an environment with large

2.Page instructions

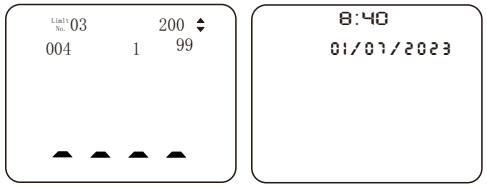


LCD : display the test process and test results.
Up key: view the last set of test results and have other menu selection results.
Down key: View the next set of test results and have other menu selection results.
Confirm key: key to start detection.
select key: Enter limit setting.
Time key: Press to enter the time setting.
On key: button switch machine.
Set key: it has some other special functions, such as entering the delete interface.

temperature changes (changes greater than 5 ° C).After the internal calibration is completed, the instrument enters the test state
4.3 Preparations:After the internal calibration is completed, the instrument enters the inspection state:
4.4 Shutdown :Please press the on/off button POWER. The display disappears after the instrument beeps once. Tip: The shutdown button POWER cannot be used during specimen testing.
4.5 Energy Saving Mode When the instrument is turned on, the standby time is more than 10 minutes (that is, the machine has no action for more than 10 minutes).The system automatically enters the energy saving state. To restore, press the power button POWER .

5. Clock setting and adjustment

In the screen to be checked, if you press(TIME), you can display the current time and date:



To adjust the time and date press(TIME), then press the Up(▲)and Down(▼) keys to change the flashing number, press (ENTER/TEST)to confirm the number. Tip: Press the (SELECT) key at any time to abort the setting, the time and date do not change. When the battery is first installed or replaced, the instrument automatically enters clock setting mode. After the clock is set, the

instrument continues its internal calibration. If the time setting is not correct (size month, leap year setting error), press the(ENTER/TEST)key after the instrument will beep once to indicate the time setting error, and start the setting again.

6. Set the upper and lower limits of test results

This instrument can store up to 100 limit serial numbers (0-99)The measurement results of each limit number have a pair of high and low limitsRange of values.

Note: The so-called limit number refers to the specific health

requirements of different test objects. How to choose the high of different test objects Please contact the local health and epidemic prevention department or set the limit according to the testing requirements.

6.1 Change the serial number :

When the test is ready, press (SET)key to change the limit number, press up key (▲) and down key (▼) to change the blinking limit number, and then press (ENTER/TEST) key to determine.Tip: During the setting process, press the (SET) key again to exit the setting, and the limit number remains unchanged.

6.2 Changed limit range

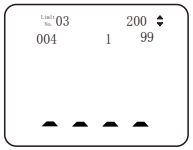
Press(SET)key first, then press(▲)key and(▼)key to change the blinking limit number, press(SELECT)key to confirm the required limit number, and then press up key(▲)or down key(▼)to select the upper limit value, press(ENTER/TEST)key to confirm; Then choose the lower

limit Value, then press(ENTER/TEST)to save the new value. Tip: When changing the upper and lower limits, press(SELECT)to exit the setting mode, and the limit serial number and range remain unchanged.

7.Specimen testing and test results

7.1 Measurement

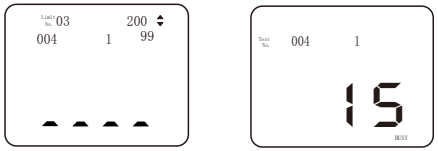
Turn on, and after internal calibration is complete, measure the new specimen The preparations are almost complete.



The screen displays the limit number, the high and low limit, and the number of stored test data (eg. 4, indicating that the instrument is

currentlyA total of 4 test results are stored).Tip: When the storage result reaches more than 95% of the memory, the memory identifier will flash. When the memory is completely full,No more tests can be done unless the memory is cleared or transferred to the computer.Follow these steps to measure:

1. Take out the test
2. Ensure that the surface of the test is clean and dry
3. open the hatch cover, insert the test into the instrument, cover the upper cover
4.press the(ENTER/TEST)key and wait 15 seconds to display the reading 5, when the detection, the screen will display a new detection number, while the timer for 15 seconds countdown.



Tip: Keep the instrument upright and steady during the test to ensure that the liquid in the swab is at the bottom of the swab. After the measurement is completed, the detector will display the new detection data and automatically compare the data with the limit range The indicator is displayed through the display screen, and the top cover indicator flashes to prompt the removal of the sample. Press the (ENTER/TEST) button again, instrument Will enter the inspection state, can proceed to the next inspection.

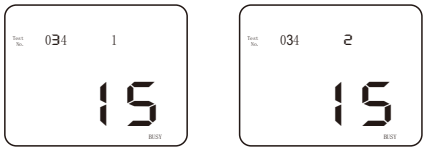
The meanings of each logo are as follows:-- -- -- -- -- -- -- -- -- -- -- -- -- --

Detection data ≤ Lower limitDetection data > Low limit ≤ high limitDetection data > High limit

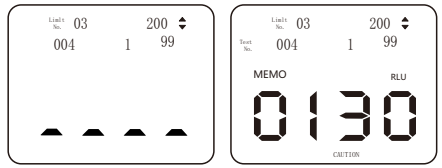
– -- -- -- -- -- -- -- -- -- -- -- – –

Tip: After the measurement is completed, be sure to remove the swab to prevent the liquid in the swab from leaking and damaging the instrument

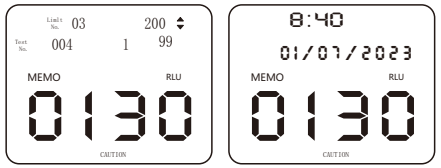
7.2 Viewing Existing Test ResultsStorage instructions:



Note: The 1 after the TestNo three digits is the number of the first group, 001 through 999. The 2 after the three digits indicates the number of the second group, 000 to 999. 034 2 can be regarded as the 1034th number.When the instrument is ready to be tested, press up(▲)and Down(▼) to view the previously stored test results.

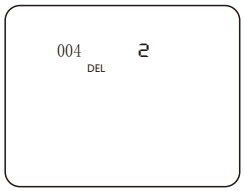


When the display displays the stored detection result, the memory identifier appears and the detection number value flashes. ▲Key is used to search for the storage result backward, and ▼key is used to search for the storage result forward. To see the time and date when the detection number was detected, press TIME.To exit the viewing mode, press FORCE .



7.3 Clearing a Storage Result Record
After entering the view mode, you can delete all test results, hold down the SELECT key for more than two seconds, and display the number of all test

results. Delete it? Blink: Hold down the ENTER TEST key for more than two seconds to clear all data; Press any other key to cancel.



8.Technical parameters

Precision	1X10^{-15}mol ATP (standard)
Detection limit	≤1.0 CFU/ml
Detection range	0RLU~9999 RLU (Relative luminous unit)
Fecal coliform	≥1×10^{-6} CFU
Testing time	1 second-60 second
Testing interference	±2％or±2 RLUs
background value	≤2RLU
Check out the mode	RLU or Coliform screening
Limit number can be set	More than1000

9.2ATP test swab test operation

1. This reagent should be matched with ATP fluorescence detector.
2. Luciferase was found in ATP swabs, and repeated freezing and thawing would lead to its gradual inactivation. In order to achieve better use effect, the number of freezing and thawing should not exceed 3 times, and need to avoid light storage.
3. Disposable gloves should be worn during the experiment to avoid contamination by exogenous ATP.
4. Do not touch the swab or swab during the sampling process and ensure that the swab is in direct contact with the surface of the object being tested.
5. After the sample reacts with the solution in the swab, place it in the fluorometer and read it within 2 minutes.
6. The smear area for standard operation is 10x10 cm². For irregular tables, it is important to ensure that each test is performed continuously and consistently at each control point. The control point

should consider the different special structure of the table and set their own standards, such as table smoothness, instrument joints, sunken areas, whether there are cracks in tableware (easy to hidedirt), etc

7. It detects the cleanliness of the surface of objects with low visual resolution. Therefore, if there is visible dirt at the control point under test, or the swab head becomes obviously black after application, the subsequent operation can be stopped to avoid waste of the swab.
8. If there is excess liquid on the surface of the object to be tested, wait for the surface liquid to dry slightly before testing, so as not to dilute the reagent. (No need to be dry)
9. If you need to test the liquid, you can use the sampler to absorb drops and add two drops of sample in the test tube, put the test specimen shaking, and mix with the luminescent reagent. (Do not wipe the liquid directly)

Storage size	More than3000
Size (W×H×D)	199mm×76mm×37mm
Weight (battery included)	265 g
Operating temperature range	0℃~ 40℃
Relative humidity range	20％-85％
Continuous degree	600
Power Supply	2x1.5V AA(UM-3) battery
Standard Accessories	Main Unit Carrying Case(B04)
Optiopnal Accessories	Test Swabs RS-232C Data Cable with Software

9.ATP Test swab instructions

9.1AtP test Notes for swab test

- Open the test tube and take out the swab for sampling;
- Do not touch the swab or test stick;
- After the detection tube is removed from the refrigerator, it should be placed for about 5 minutes before detection to restore it to room temperature;

10.Code error

In operation, the instrument itself has a variety of self-checks, once there is a problem, will display an error code:

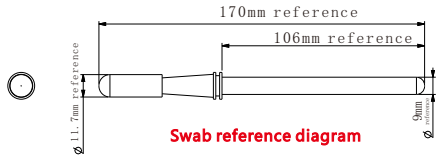
Error code	Possible causes
E1 Out of operating temperature range	√The operating temperature of the instrument exceeds the normal range √The instrument is stored outside the operating temperature range adjust the instrument to the normal temperature range before use
E2 Failure to self-calibrate	×Equipment damaged or wrong √Unstable instrument environment √The protective mouth is dirty or severely cracked × Equipment is damaged or wrong × Protective port is damaged
E3 Can't store	√ The device has no power or loose battery × The memory function of the device is damaged or faulty

Tip: most of the problems are temporary, press THE OK button or take out the battery more than 10 seconds and then put back in can be solved. If the fault persists, contact technical support engineers.

- The swab sample can be placed for about 4 hours under the condition of avoiding light ,
- After the sample has reacted with the solution in the swab, place it in the fluormeter and read it within 2 minutes.
- The swab solution has been diluted and is safe for use on food surfaces.

Note: Store away from light before use.

ATP swabs and ATP fluorescence detectors were used to detect cleanliness and total bacterial count of public places, indoor dining utensils, desktops, operators' hand surfaces, medical and health industry operating tables and medical scopes. It is the product for HCCP monitoring in food industry



Swab reference diagram

11.Instrument buzzer

The instrument emits various beeps during normal use:

Types of buzzes	Possible causes
Shorthigh	Startor shutdown the test specimen and PC connected to record the clearance results
Longhigh	Instrument self-calibration is completed, specimen testing is completed, and result records are cleared
Long bass	Enter invalid date Enter invalid value of the limit

12.Fault preview

The detector failure is generally due to the battery, such as can not open, shut down, abnormal shutdown, most of the reasons for the battery is dead, loose battery caused by the battery is still unable to work normally, please contact the manufacturer.

The following table lists some typical cases and their possible causes.

√ Indicates that users can solve the problem by themselves.

X indicates a problem that may require technical assistance. Please contact the manufacturer.

situation	The cause of the problem
Abnormal shutdown	√ If the instrument is not used for more than 10 minutes, it will automatically shut down and enter the standby state
Press the keyboard and there is no response	√ Some keys are only effective after a certain program is selected × the instrument is damaged or wrong
Test result readings always show RLU or always lower than expected	√Improper swab use, √Swab expired, √Shut down and restart √Operating instruments in an unstable environment, √ The protection mouth is dirty and can be seriously cracked × Equipment is damaged or wrong
The USB interface does not work	√ The interface is improperly inserted × The PC serial interface or system software fails × Equipment is damaged or wrong × The cable or interface is damaged √ The PC software is incorrectly installed or selected

11. Use technology training

How to build a perfect ATP detection program:

11.1 How Can I Set ATP Detection Standards?

It is important to set pass and fail criteria for real-time ATP detection programs, and these criteria are based on production

The environment, the type of product produced will vary, but the method of setting such testing standards is the same.

There are two ways to set ATP test standards: 1.Clean thoroughly;

2. Daily cleaning

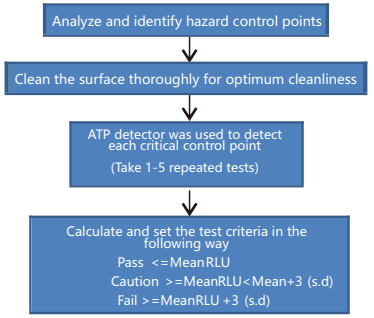
Thorough cleaning is usually suitable for equipment surfaces with high cleanliness requirements

Or easy to clean smooth surfaces, while daily cleaning is suitable for

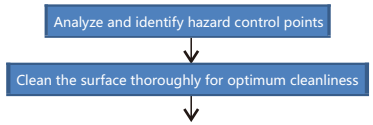
coarse

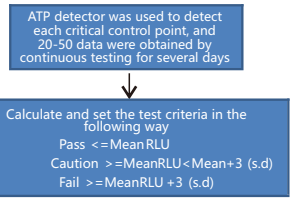
Rough and difficult to clean surfaces.

Step 1 Clean thoroughly



2.Daily cleaning





"Warning" data plays a very important role in providing users with analysis and early warning. Of course, users can also set all data above the qualified line as unqualified without setting the warning area

3. Universal ATP-030 detection standard

The ATP-030 also provides users with common detection standards, which may not be applicable to the target surface you are examining. To set your own detection standards, please refer to 1); 2).

ATP-030 Test criteria for easy to clean surfaces

ATP-030	Pass	Caution	Fail
RLU	20	20-60	60

* Easy to clean surface including stainless steel surface or smooth surface without groove, such as sink, washing bucket, blade, table top, trash can, etc

ATP-030 Test criteria for difficult to clean surfaces

ATP-030	Pass	Caution	Fail
RLU	30	30-100	100

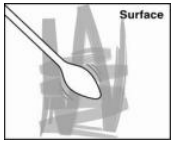
* Difficult to clean surfaces including grooves, cracks, notched surfaces such as conveyor belts, nozzles, circular rings, rubber pipes, walls, etc

* note:

If the user has the standard plate count standard for the total number of colonies in the control site, the ATP test result can be referenced with it. But please pay attention to ATP comes from microorganisms or organic residues, so it can only be said that the level of ATP is closely related to the number of microorganisms There was a close correlation between the results of ATP detection and plate count.

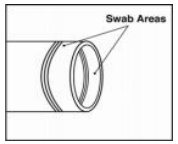
11.2 Sample for Detecting a Surface:

A) Regular surface smear the area under test with a swab tip (30-45 ° Angle, 10× 10 CM surface)



Rules of the surface

B) Irregular surface When the surface area of 10×10CM cannot be obtained, adequate area should be applied as far as possible.



irregular surface

11.3ATP-030 handheld portable fluorescence detector and detection reagent

Mode of use:

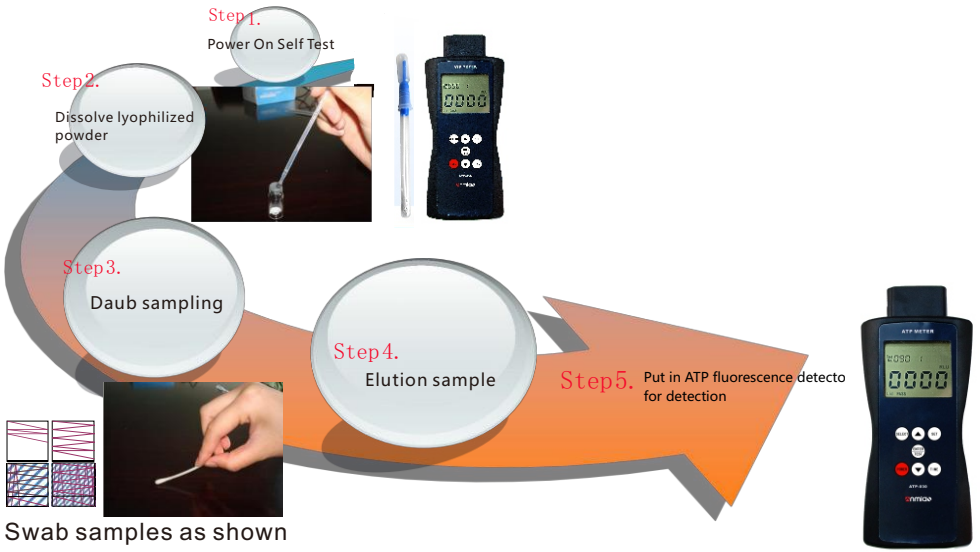
11.4 Setting the Detection Frequency and Interval

A) Detection time:

1) ATP detection surface should be dry surface.

2) In general, ATP detection should be performed before the use of disinfectants.

3) However, some CIP procedures require ATP detection after the disinfectant is used. In this case, the



Swab samples as shown

12. Questions and answers on food safety and health testing

12.1 What factors may affect food safety and hygiene?

There are four major factors: biological (such as the total number of bacteria exceeding the standard, pathogenic bacteria pollution, etc.), chemical (pesticide residues, toxic additives, etc.), physical (radiation pollution, etc.) and transgenic products (harmful genetic effects, etc.).

Among them, food-borne poisoning caused by bacterial contamination of food and drinking water is the most common, and its harm scope is the most extensive.

12.2 What methods are commonly used at home and abroad to detect the total number of bacteria in food, health and epidemic prevention?

"Conventional method" and "ATP fluorescence fast detection method". The conventional method is the method still used by the Ministry of Health. Therefore, it is also known as the "national standard method", namely the (bacterial) viable cell dish counting method.

12.3 What are the common points and main differences between the conventional method and the fast ATP fluorescence detection method?

Both methods can be used to detect the total number of bacteria in samples and provide relevant health and epidemic prevention data. The main difference is in the "timeliness", the conventional method at least 1-2 days to get results, quick test method can be in

Real-time detection data can be obtained within 1-5 minutes.

disinfection contact time of the disinfectant is 5-15 minutes.According to the disinfection specifications, wait for the disinfectant to dry before conducting surface sampling.

★ Note: it can be sterilized by high pressure steam with ATP detection. Can effectively save the use of disinfectant.

B) Sampling and testing frequency: According to the financial situation, select the appropriate number of sampling points and recommend the following strategies:

1) ATP detection should be used as a sampling and preliminary screening method. (Suspicious results can be further sampled for standard plate counting)

2) Detection scheme (for reference only)

- Each workshop to establish 5-10 testing points.
- Each detection point 1 to 2 times a week.
- Regularly summarize and report the results in chart form to provide short-term evaluation for control measures.
- Provide quarterly or annual reports to analyze longer term data.

11.5 Make corrective measures according to ATP quick test results

testing result	result judgment
The detected value is lower than the Pass value	Clean the qualified
The detected value is between the Pass value and Fail value, which requires Caution.	Pay special attention to this area when cleaning next time
The detected value is higher than the Fail value	To clean

12.4 Why is there such a big difference in "timeliness" between the two methods?

Because they are based on different basic principles. In the "conventional method", the previously invisible bacterial cells in the sample are diluted and coated and incubated on nutrient AGAR medium at 37°C for 48 hours. In this way, a living bacterial cell forms hundreds of millions of visually visible bacterial clusters (colonies) after multiple divisions and propagations, and then the results are obtained by counting. That is, colony forming unit /ml (g) [CFU/ml (g)]. "ATP fluorescence fast detection method" is based on the principle that entomtinase can catalyze ATP of bacterial cells to emit fluorescence, and the fluorescence detector can

measure the fluorescence value quickly and accurately. Therefore, the more bacterial cells in the sample, the greater the amount of ATP, and the stronger the fluorescence. In this way, the detection of fluorescence value (RLU) can determine the cell number of bacteria [CFU/ml (g)] without the interference of non-bacterial ATP in the sample.

12.5 Which of the two detection methods is more accurate? Two test parties

Are the data consistent with the method?

Before answer this question, let's remember two basic concepts: microbiology bacteria or microbes on human life, production of advantage, such as for antibiotic production) or

harmful effects (e.g., contaminated food, cause disease) is not a single or a few bacterial cells, but hundreds of thousands of per unit volume, the effect of millions of cells in the group. Second, under the right conditions, bacteria can divide and reproduce every 20 to 30 minutes. In the case of E. coli, 100,000 cells per milliliter became 6.4 million cells per milliliter after two hours. The correct answer, therefore, is that both methods meet the needs of total bacterial detection and health monitoring at a given time, but with significant differences in timeliness. Quick inspection method is more conducive to ensure the overall improvement of food safety level. It is a common practice in developed countries to establish an effective range of food safety and health

standards (such as pass, warning and fail) that can be cross-referenced between the conventional method and the ATP fluorescence fast detection method.

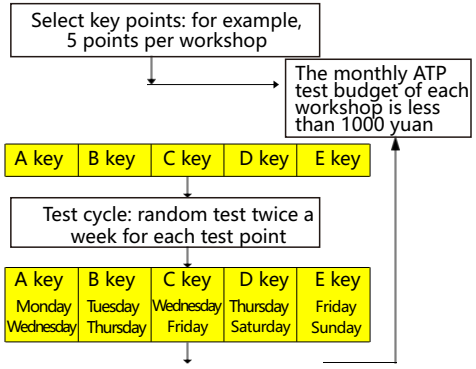
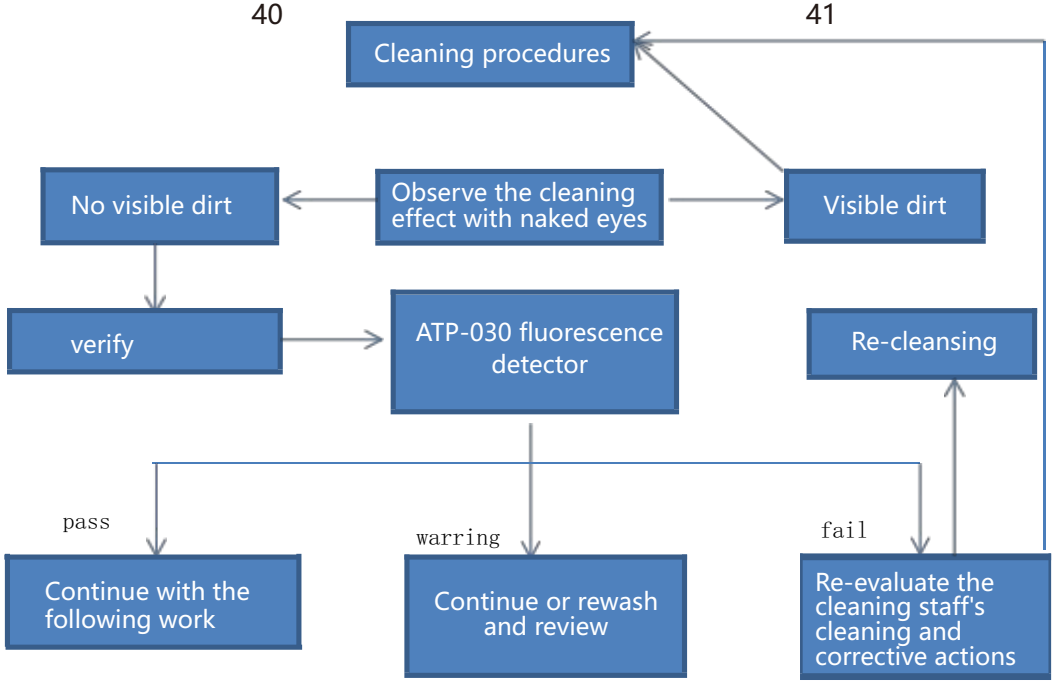
12.6 What experiences and measures are worth learning from abroad in terms of food safety?

Since the 1990s, according to the principle of firefly luminescence, the United States, the United Kingdom, Japan and other countries have developed and promoted the use of ATP fluorescence fast detection equipment for detecting the total number of bacteria in food or for health and epidemic prevention monitoring. These devices not only provide real-time detection data, but also are accurate, portable and easy to

use. It not only makes up for the poor timeliness of the "conventional method", but also plays an early warning role. It effectively ensures the improvement of the overall level of food safety, and also promotes the birth of food hygiene concepts such as HACCP.

12.7 What is the relationship between "ATP fluorescence quick detection method" and the implementation of HACCP warning and traceability management system for food safety?

Before the establishment and popularization of ATP fluorescence rapid detection technology, the hygiene level of production line and food contact surface can only be assessed by visual inspection or plate counting before delivery or after

sensitivity of these two methods is insufficient, or the time to obtain results is too long to meet the actual needs of production. In other words, HACCP and food safety traceability and early warning system can only be implemented if ATP fluorescence fast detection method is adopted.

13. Comprehensive diagram of ATP rapid detection