MA5800
Milk Analyzer Instruction Manual



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MA5800 - Milk Analyzer

Chapter 1 Safety Precautions

！Before using the instrument, the user must read the safety instructions carefully.

1.1 Operation requirements

(1) Operate the instrument in strict compliance with safety requirements.
(2) Only personnel who have received safety training can use the instrument.
(3) If the malfunction happened to the instrument, turn off the power immediately.
(4) If the instrument is damaged, the user shall not open the instrument or replace other components without authorization, and contact the supplier in time.
(5) Only professionals from the manufacturer of this instrument can repair the instrument.
(6) According to the product technical standards, the operating conditions of the instrument are as following: Indoor temperature between 10℃ and 40℃ and relative humidity between 30%-80%.

1.2 Electrical Safety

(1) Before connecting the power cord to the instrument, make sure that the power adaptor provided by the factory is used.
(2) When connecting the power cord, make sure that the instrument switch is in the off state.
(3) Do not touch the power switch and power cord with wet hands.
(4) Do not unplug the power cord when the instrument is powered on.
(5) Do not clean the instrument when the instrument is powered on.
(6) Please turn off the power when the instrument is not in use.

Chapter 2 Overview

2.1 Application Scope

It can measure various pure milk products such as raw milk, skim milk, UHT milk, etc.

2.2 Basic principle

A comprehensive analysis was conducted on the propagation characteristics of ultrasound in different media, as well as the structure and composition of milk. The effects of fat, non-fat milk solids, protein, temperature, and other factors on ultrasound attenuation and velocity were studied. By establishing correlation curves, the relationship between different substances in milk and ultrasound properties was illustrated.

2.3 Main function

In a very short 60S, the physical and chemical indicators of the milk sample are analyzed to obtain the composition content of the sample.

2.4 Main components

This instrument is mainly composed of a control system, a detection system, a sample area, and a shell component.

2.5 Main structure

2.5.1 Front panel

As shown in Figure 1:

1. Display screen: operation information, data display.
2. Press the "∧" key, the pointer moves upward.
3. Press the "<" key, the pointer moves to the "left".
4. Press the ">" key, the pointer moves to the "right".
5. Press the "∨" button, and the pointer moves downward.
6. Sample suction tube, suck the sample into the instrument detection area.
7. Sample cup, store samples and recover waste samples.
8. PH detection area. (Optional)



Figure 1

2.5.2 Rear panel

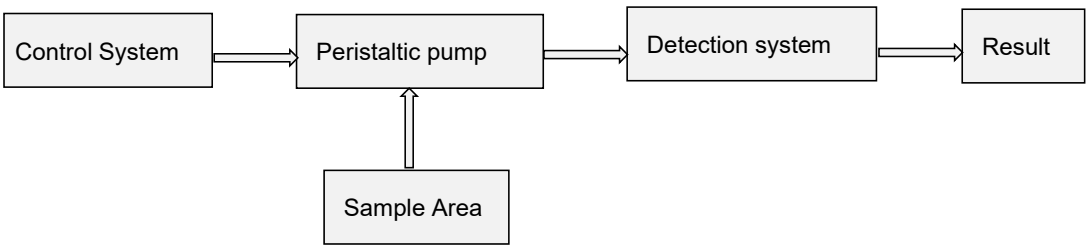
As shown in Figure 2:

1. PH detection tube interface. (Optional)
2. RS232 interface, used for printer communication port and PC communication port.
3. 24V power connector.
4. Switch
5. Cleaning liquid inlet. (Optional)
6. Cleaning liquid outlet. (Optional)



Figure 2

2.7 Analyzer Block Diagram Description



As shown in Figure 1, the control system controls the peristaltic pump to suck the sample into the detection tube (detection system), the countdown is 60 seconds, and the detection system analyzes the milk composition through ultrasonic reflection reception, obtains the results and display in the screen.

2.8 Application areas
Dairy farms
Milk collection stations
Milk trucks and other circulation links
Milk production enterprises
Milk retail market
Livestock government regulatory departments

2.9 System performance parameters
2.9.1 Basic performance

Volume of the sample to be tested	20 ml
Dimensions	(width 88.4mm * length 188mm * height 191mm)
Weight	1.2 kg
Power supply	Input: 100~240V_2A, 50/60Hz

	Output: 24V_3A
Power	<72W
Communication interface	RS232-USB connector
Printer interface	RS232-USB miniB connector
PH interface (optional)	USB Type-B connector

2.9.2 Using environment parameters

Operating environment temperature	10～40℃
Operating environment relative humidity	30%～80%
Transportation and storage temperature	10～55℃
Transportation and storage relative humidity	<80%
Atmospheric pressure	860h Pa～1060h Pa

2.9.3 Detection performance

Fat	0-6%	±0.1%
	6-10%	±0.18%
	10-20%	±0.6%
Cream fat	20-45%	none
Non-fat solids	5-10%	±0.4%
Protein	2-4%	±0.12%
Density	1015-1040 kg/m³	±0.4 kg/m³
Water content	0-70%	±3%
Lactose	0-15%	±0.2%
Mineral	0-1%	±0.05%
Freezing point	（-0.45）-（-0.60）℃	±0.005℃
PH (optional)	0-14PH	±0.05%

Note: Density data is displayed in an abbreviated form. For example, 27.3 is the actual value: 1027.3 kg/m³. It is to add 1000 to the original value.

Example: The result is 21.20; the actual density is=1000 + 21.20=1021.2kg/m³

Chapter 3 Instrument Installation

3.1 Transportation and storage

The transportation shall be carried out in accordance with the requirements of the sales contract. The original packaging must be used during transportation to avoid damage to the instrument. When the product is packaged for transportation, it should be stored in an environment with an ambient temperature between 10 ℃ -55 ℃ , a relative humidity between 30%-80%, and no corrosive gases in the air.

3.2 Unpacking

The outer packaging of the product is a cardboard box with foam filling inside it. After unpacking, check whether the items you received are complete and in good shape.

! If the product is obviously damaged during transportation, please do not use it and contact the seller in time!

3.3 Item List

Items	Quantity
Instrument Host	1 unit
24V DC power cable	1 strip
RS232-USB communication cable	1 strip
Thermal printer （optional）	1 unit （optional）
RS232-USB miniB printer cable	1 strip
Thermal printer paper	2 rolls
Acid cleaning reagent	1 pack
Alkaline cleaning reagent	1 pack
Injection cup	6 pieces
Instruction manual	1
Certificate of Quality	1
Warranty card	1
Factory inspection report	1
Packing list	1

！If there is any missing or damages, please contact the seller immediately！

3.4 Instrument working environment

3.4.1 The instrument must be placed on a stable and horizontal work surface, away from direct sunlight and away from heating equipment.

3.4.2 The instrument must be in an ambient temperature of 10-40℃ and a relative humidity of 30%-80%.

3.5 Instrument installation

3.5.1 Users must be trained by professional technicians from the manufacturer or dealer before installing and using the instrument.

3.5.2 Place the device on a horizontal work platform and connect accessories such as a printer and pH probe.

3.5.3 Check whether the power switch is in the "OFF" position, plug in the power supply using the matching power supply, and turn on the device.

Chapter 4 Sample and reagent preparation

4.1 Preparation of milk samples to be tested

(1) Before sampling, first check whether the milk is normal milk. Normal milk should be a milky white or light-yellow uniform liquid, without precipitation, impurities, clots, viscosity or thickness, and have the pure aroma inherent to fresh milk without peculiar smell. Abnormal milk will damage the precision components of the milk component analyzer and affect the test results.

(2) The temperature of the milk sample to be tested should preferably be between 15℃ and 25℃. If the sample has fat floating on the surface, the sample must be heated to 40 ℃-50 ℃ and stirred evenly to dissolve the surface fat again, then stirred and

cooled to below 25℃ before sampling.

(3) Sampling should be performed correctly using a dedicated aluminum, stainless steel or glass container according to the national standard method. Before sampling, the milk must be fully stirred with a dedicated stirrer to mix evenly, and there should be no fat floating on the surface. If it is used to calibrate the instrument, the sample volume should be no less than 150mL. Pour the sample back and forth 4 to 5 times with the same container, then filter it with folded gauze, and finally pour it into the sample cup and place it in the instrument for sampling and testing.

(4) Before sampling, check whether the sample contains bubbles. Bubbles have a great impact on the test results of the instrument. Slow stirring is required to eliminate bubbles. The sample must be filtered through gauze before sampling.

(5) Freshly squeezed milk is required to stand for more than one hour before sampling and testing. Because there are a large number of small bubbles and active substances suspended in freshly squeezed milk, many substances such as fat are distributed on the surface of the bubbles, which will cause confusion in the test results.

(6) If the surface of the milk sample has formed a membrane, or the acidity is greater than 250T, re-sampling is required.

(7) The waste liquid discharged from the test should be discarded and cannot be used for repeat measurement.

(8) The sample should be tested within half an hour after sampling. The sample should be refrigerated and brought back for analysis if it is far away. If fat floats before analysis, it should be heated to dissolve the fat.

4.2 Cleaning reagent preparation

4.2.1 Daily cleaning reagent preparation (alkaline cleaning reagent)

Prepare a 3% cleaning reagent by dissolving 3g of cleaning reagent powder in 100ml of 40℃ distilled water. Each cleaning operation takes 2 minutes, with a total of 8 cycles of cleaning.



Lactodaily

Alkaline detergent sanitizer with QAC.

General Description:
Alkaline powder product with QAC for combined cleaning and disinfecting of all types milk analysers Lactoscan according their instructions. Suitable for all water conditions and may be used for manual application as well as for automatic circulation cleaning. Non corrosive on most materials and mild to skin.

Application:
Automatic application:
1. Pre-rinse with sufficient water to remove milk residues
2. Circulate a 1% (10 g/l) cleaning solution for 10 to 20 minutes at a temperature above 40°C
3. Rinse thoroughly with tap water.
Manual application:
Use 0,5 - 1,0%(5 - 10g /l) after sufficient pre-rinsing at 30 to 40°C, soak for at least 10 minutes Rinse thoroughly with tap water.
Determination of concentration Titration of p-value with
1 N Hydrochloric acid
Special instructions:
Keep container closed and away from humidity.

Material Compatibility:
Stainless steel and Aluminium are not affected by the solution.

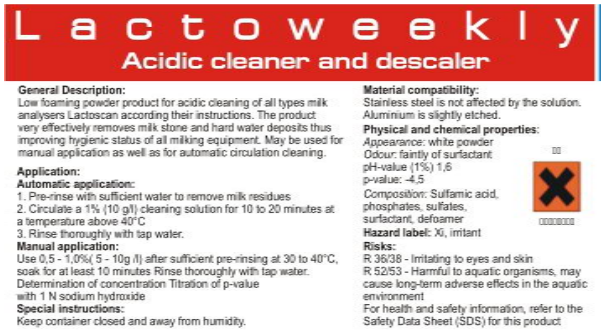
Physical and chemical properties:
Appearance: white powder
Odour: faintly of surfactant
pH-value (1%) 11,5
p-value: 4,5
Composition:
Carbonates, phosphates, silicates, surfactants, defoamer, disinfectant

Hazard label: Xi, irritant

Risks:
R 36/38 - Irritating to eyes and skin
For health and safety information, refer to the Safety Data Sheet (SDS) for this

4.2.2 Preparation of weekly cleaning reagent (acidic cleaning reagent)

Prepare a 3% cleaning agent, using 3g of cleaning agent powder to dissolve in 100ml of 40℃ distilled water. Each cleaning operation takes 2 minutes, with a total of 8 cycles of cleaning.



Lactoweekly

Acidic cleaner and descaler

General Description:
Low foaming powder product for acidic cleaning of all types milk analysers Lactoscan according their instructions. The product very effectively removes milk stone and hard water deposits thus improving hygienic status of all milking equipment. May be used for manual application as well as for automatic circulation cleaning.

Application:
Automatic application:
1. Pre-rinse with sufficient water to remove milk residues
2. Circulate a 1% (10 g/l) cleaning solution for 10 to 20 minutes at a temperature above 40°C
3. Rinse thoroughly with tap water.

Manual application:
Use 0,5 - 1,0%(5 - 10g /l) after sufficient pre-rinsing at 30 to 40°C, soak for at least 10 minutes Rinse thoroughly with tap water. Determination of concentration Titration of p-value with 1 N sodium hydroxide

Special instructions:
Keep container closed and away from humidity.

Material compatibility:
Stainless steel is not affected by the solution. Aluminium is slightly etched.

Physical and chemical properties:
Appearance: white powder
Odour: faintly of surfactant
pH-value (1%) 1,6
p-value: 4,5
Composition: Sulfamic acid, phosphates, sulfates, surfactant, defoamer

Hazard label: Xi, irritant

Risks:
R 36/38 - Irritating to eyes and skin
R 52/53 - Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment
For health and safety information, refer to the Safety Data Sheet (SDS) for this product

Chapter 5 Instrument Operation

5.1 Start the instrument

When the instrument is turned on, the logo will be displayed first, and then it will enter the power-on preheating state. (The instrument takes less than 1 minute to enter the stable state. The length of the preheating time is related to the ambient temperature). When the instrument completes the preheating process, it will beep and the screen will enter the main interface.

Preheating...

5.2 Main interface

The default selection when powering on is the detection position, which can be selected by pressing the "∧" and "∨" buttons. Press ">/Confirm" to enter the selected function.

Detection
Cleaning
Settings
History
Version

5.3 Detection function

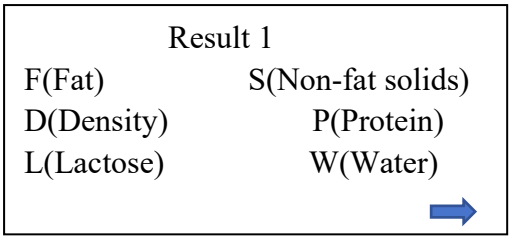
① Move the pointer to Detection, press ">/Confirm, and enter the detection interface. (The instrument is equipped with three detection modes, and the first detection mode for raw milk-cow's milk is used by default. If other modes are required, please go to Settings-Mode Function to select other measurement modules, such as UHT, goat's milk detection mode.)

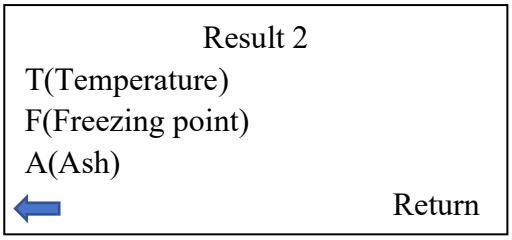
Detection	
Quit	Start

②Pour the sample into the sample cup, and then place the sample cup under the pipette. Press the “>/Confirm” button, the instrument starts to suck the milk sample, the screen shows a 60-second countdown, and after 60 seconds the screen displays the test results, and the milk sample is discharged at the same time.

③Display results

Press “>/Confirm” in result 2 to return to the test interface.





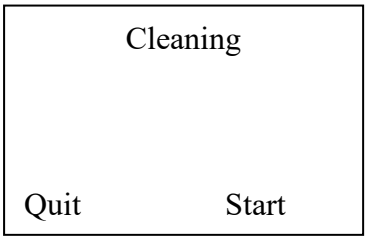
Note 1: If the first test result is just after cleaning the instrument, there may be a certain error, because the residual water inside will affect the test result. It is recommended to retest.

Note 2: Please remove the sample after the test. If you need to test it again, you must resample, otherwise it will affect the repeatability of the test result.

Note 3: If you test water, the instrument will not display the results of freezing point and water addition rate.

5.4 Cleaning function

① Move the pointer to Cleaning, press “>/Confirm” to enter the cleaning interface.



②Pour the cleaning solution into the sample cup, and then place the sample cup under the pipette. Press the “>/Confirm” button, the instrument starts to suck in the cleaning solution for cyclic cleaning, the cleaning fan on the screen starts to rotate, the cleaning is completed in about 60 seconds, and the cleaning solution is discharged at the same time.

Note: Please strictly follow the cleaning procedures for cleaning, otherwise the accuracy of the instrument will be damaged.

5.5 Setting function

The pointer moves to the setting function, press “>/Confirm” to enter the setting function interface.

Setting
Language
Mode
Time
Calibration
Calibration

5.5.1 Language Settings

① Move the pointer to the language settings and press“>/Confirm”to enter the language settings interface.(The currently selected language is followed by an “*”.)

Language	
English	*
Russian	

② Use “∧” and “∨” to move the pointer, select the language to switch, press “>/Confirm” to save and complete the switch to exit the language setting interface and return to the setting interface.

③ Press “</Cancel” to exit without modification.

5.5.2 Mode selection (different milk samples need to select the corresponding mode)

① Move the pointer to the mode setting, press “>/Confirm” to enter the mode selection interface. (The currently selected mode is marked with “*”.)

Model	
Cow's milk	*
Goat's milk	
UHT milk	

② Use “∧” and “∨” to move the pointer, select the mode to switch, press “>/Confirm” to save and complete the switch to exit the mode selection interface and return to the setting interface.

③ Press “</Cancel” to exit without modification.

5.5.3 Time setting

① Move the pointer to time setting, press “>/Confirm” to enter the time setting interface.

Time
Year：2024
Month：9
Day：25
Hour：14
Minute：12
Cancel/Save

② Use “∧” and “∨” to move the pointer to the data to be modified, and use “>/Confirm” and “</Cancel” to “+” and “-” the data to complete the modification.

③ Use “∧” and “∨” to move the pointer to the cancel/save position. Press “</Cancel” to exit without canceling the modification, and press “>/Confirm” to save the modification and exit. Return to the setting interface.

5.5.4 Calibration settings

Note 1: The mode selected is the mode in which the calibration modifies the data in the corresponding mode.

Note 2: Calibration is a function added to adapt the instrument to the conditions of the local milk source, so take the local pure milk and compare it with the actual measured chemical value. Then proceed with the following steps:

Example:

parameter	Traditional methods	This device results	Correction value
F	3.65%	3.92%	-0.27%
S	8.3%	7.4%	+0.9%

① Move the pointer to calibration setting, press ">/Confirm" to enter the parameter calibration setting interface.

Calibration
F(Fat)
S(Non-fat solids)
D (density)
P (protein)
L (lactose)

W (water content)
T (temperature)
F (freezing point)
A (ash content)
Cancel/Save

② Use “∧” and “∨” to move the pointer to the data to be modified, and use “>/Confirm” and “</Cancel” to “+” and “-” the data to complete the modification.

③ Use “∧” and “∨” to move the pointer to the cancel/save position. Press “</Cancel” to exit without canceling the modification, and press “>/Confirm” to save the modification and exit. Return to the setting interface.

5.5.5 Calibration setting

The product has an internal curve calibration function, which is generally used by instrument manufacturers for internal calibration. The operating requirements are relatively strict, and improper operation has a great impact on the accuracy of the instrument. It is generally recommended to contact the manufacturer for network assistance or return to the factory. It is necessary to prepare three samples such as high fat, low fat, and distilled water, as well as the accurate results of the samples.

5.6 History function

① Move the pointer to the history function, press “>/Confirm” to enter the history function interface.

History
1.20240224-19.53
2.20240224-19.53
3.20240224-19.53
4.20240224-19.53
5.20240224-19.53

6.20240224-19.53
7.20240224-19.53
8.20240224-19.53
9.20240224-19.53
10.20240224-19.53

②The history function retains the latest 10 test data, which can be viewed.

③Move the pointer to the test data you want to view and press “>/Confirm” to enter the data interface. In the data viewing interface, if a printer is connected, you can print the data.

5.7 Version number function

Move the pointer to the version number function and press “>/Confirm” to enter the version number function interface. It contains basic information of the instrument, hardware version, software version, etc.

Chapter 6 Error Handling

6.1 Host overheating

The screen shows "Host overheating error 01"

Reason: The temperature of the instrument itself is overheating

Solution: Turn off the device immediately. Check the ambient temperature, power supply, etc. Wait for another 10 minutes and restart the device.

Drain the milk sample and place the instrument in a cool place to cool down.

If the problem persists, you need to return to the seller for inspection, the internal temperature control module might have been damaged.

6.2 Insufficient milk sample/air

The screen shows "Insufficient milk sample or air error 02"

Reason: Insufficient milk sample inhaled, or air inhaled in the milk sample.

The tested milk sample has problems, including possible deterioration, adulteration, etc.

The injection pump is damaged and no sample is injected. The internal pipeline is not emptied during preheating.

The sensor is contaminated or damaged.

Solution: Check whether the pipeline is blocked by clots;
Check whether there is enough milk sample in the sample tank.
If the problem persists, you need to return to the seller for inspection, and the internal detection sensor might have been damaged.

6.3 Sample temperature is too high
The screen shows "Sample temperature is too high Error 03"
Reason: Inhalation of overheated sample.
The sensor temperature control is broken.
Solution: The sample temperature exceeds 40 degrees, please change the sample with a temperature suitable for measurement.
If the problem persists, you need to return it to the company for inspection and internal sensor temperature sensing module.

Chapter 7 Instrument cleaning and maintenance

7.1 Instrument cleaning
7.1.1 Instrument surface cleaning
When cleaning the surface, please make sure to turn off the power first. The surface of the instrument should be regularly wiped with a soft cloth and a little disinfectant, and the instrument should be wiped dry after cleaning. If there is any reagent leaking on the surface of the instrument, wipe it clean with a soft cloth and 70% alcohol.
7.1.3 Sample cup cleaning
After using the sample cup, clean it with clean water and wipe it clean with a soft cloth and 70% alcohol.
7.1.4 Cleaning the instrument detection tube
To prevent the fat minerals in the residual milk from adhering to the inner wall of the tube to form milk scale inside the detector, please follow the steps below for cleaning. If the cleaning is not thorough, the test results will be inaccurate. It is recommended that users use two cleaning powders, Lactoweekly and Lactodaily. For specific mixing methods, see the cleaning label.
Cleaning includes cleaning the surface of the instrument and cleaning the instrument pipeline. When cleaning the surface, please make sure to turn off the power first. Then wipe it with a rag. During this period, no water is allowed to flow into the instrument. The instrument pipeline is cleaned by flushing the pipeline with acid or alkaline cleaning reagent. Each cleaning process takes 2 minutes, and a total of 8 cycles of cleaning. As long as the standard operation is strictly followed, can completely eliminate various milk residues on the tube walls.

7.2 Instrument maintenance
(1) Do not turn on and off the instrument frequently. The interval between two switches must not be less than 30 seconds.
(2) Do not turn off the power or press buttons randomly when the instrument is running.
(3) The instrument should not work continuously for more than 8 hours.

(4) Please use the power cord and communication cable provided by the original manufacturer.

(5) Non-original maintenance personnel are prohibited from disassembling the instrument without authorization.

7.3 Maintenance of sampling peristaltic pump

The peristaltic pump is a very efficient pump that can control the flow rate and has a non-contact motor. The peristaltic characteristics can prevent the formation of milk scale. The suction force is elastic and is more suitable for milk sampling. However, the peristaltic tube is a consumable part. Depending on the usage, it generally needs to be replaced every one to two years. Otherwise, the rubber will age and easily cause milk leakage. It is also possible that hard particles such as stones are mixed in the milk, which can easily cause milk leakage.

7.4 Waste liquid treatment

After each experiment, the milk solution and detergent solution should be treated according to the laboratory requirements. Dispose of them as soon as possible according to relevant regulations to avoid contamination to the laboratory and instruments.

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