MD-9500 Touch-Screen Type

Operation Manual

Installation, Operation and Maintenance Guide

(English Edition)

SHANGHAI DINGLI NEEDLE DETECTOR INSTRUMENT CO., LTD.

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Chapter 1 Equipment Overview

Manual version 1.00

1.1 Product Overview

This manual describes how to install, operate and maintain the MD-9500 metal detector for aluminum-foil packaging.

This is a general-edition manual. Many models in this series differ slightly: for example, products without a motor have no “rewind distance” — “alarm length” is displayed in its place — and they have no photoelectric adjustment option, nor any mention of rewind in the operating modes.

This manual covers the full-function version; some machine versions may not provide certain functions.

> **Read this manual carefully before use**

1.2 Basic Functions

- Fully independent intellectual property rights; an original design
- 32BITS high-speed MCU, one hundred sixty million high-speed operations per second
- Built-in DSP and high-speed signal processing give good immunity to interference
- Industrial-grade full isolation ensures stable, reliable operation of the product; instability of the external power grid has almost no effect here
- 20 independent channels and 10 differential channels, designed to suit their respective applications
- Precise counting function
- Data is stored in ferroelectric memory, reliably retained for twenty years

1.3 Interface Markings

After power-on the machine enters the Home screen, shown in Figure 1-1. The red letters on the screen mark the positions of the display and operating areas; their meanings are given in the table below.

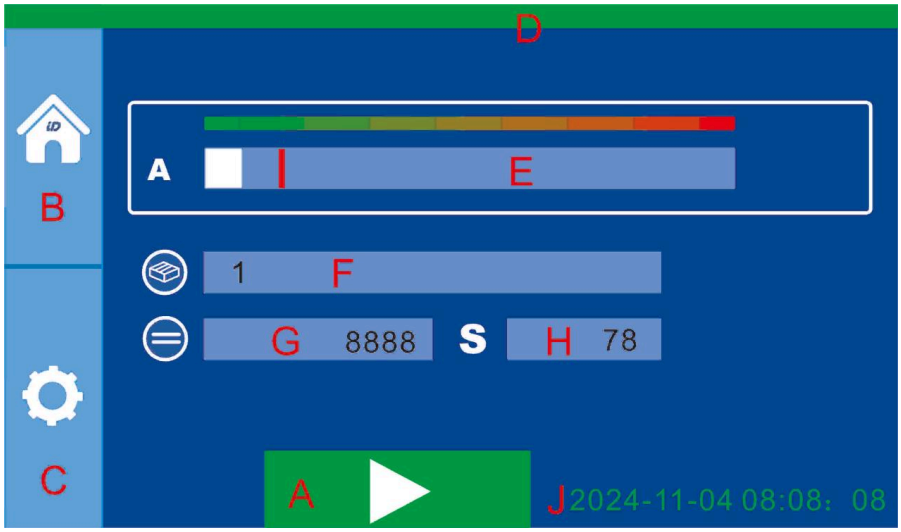


Figure 1-1 Home screen

Mark	Location	Description
D	Status bar at the top of the screen	A green barred strip when stopped; after start, a green flashing strip when no signal is detected, a yellow flashing strip when a signal is detected but no alarm has yet been raised, and a red flashing strip in the alarm state.

Mark	Location	Description
E	Signal bar inside the upper white window	The E bar shows the probe signal; if the E signal crosses the red line, metal has been detected and an alarm is processed.
F	Value box on the first row	Product code, 1-50.
H	Value box on the right of the second row	Sensitivity; press H to enter the sensitivity directly, in percent.
A	Left end of the upper white window	Starting point of the signal window, shared with the E bar.
B	Upper icon in the left navigation bar	Home icon; the icon is labeled iD.
C	Lower icon in the left navigation bar	Settings icon (gear).
G	Value box on the left of the second row	Numeric display box, shown side by side with the sensitivity box.
J	Bottom-right corner of the screen	Date and time.

> Note: items D, E, F and H in the table above are listed as described in the original text; A, B, C, G and J are position marks of interface elements whose displayed content varies slightly with model and software version — during operation, always follow what the screen actually shows.

Chapter 2 Operating Instructions

This chapter describes the Home screen and each operating procedure, in the order in which they are actually used after power-on. All letter marks mentioned in the text refer to Figure 1-1.

2.1 Start and Stop

Start/Stop is a toggle button: while stopped, pressing the button switches it to Start; while running, pressing it switches it to Stop. It is green when stopped and red when running.

External start button (not fitted on all machines)

It has three functions: 1, start — while stopped, press for less than 1 second and release, and the machine runs; 2, rewind — while stopped, hold for more than 1 second and the machine runs in reverse; release, and the machine stops; 3, emergency stop — while running, press it and the machine motor stops immediately.

For products without a motor, rewind is the alarm.

> Note: the three functions of the external button are distinguished by how long it is pressed. A short press starts the machine; a long press enters rewind; pressing it while running is an emergency stop, and the machine must be started again after it is released.

2.2 Detection Signal and Status Indication

The E bar shows the probe signal.

If the E signal crosses the red line, metal has been detected and an alarm is processed.

D status strip: a green barred strip when stopped; after start, a green flashing strip when no signal is detected, a yellow flashing strip when a signal is detected but no alarm has yet been raised, and a red flashing strip in the alarm state.

> Note: the color of the status strip is the current operating state; an alarm is indicated by the red flashing. The signal bar only reflects the instantaneous signal level and is not the detection result.

2.3 Sensitivity Adjustment

Sensitivity adjustment: press H to enter the sensitivity directly, in percent.

Sensitivity adjustment is password-controlled.

2.4 Product Selection

F is the product code, 1-50

Different products have different sensitivities and modes; once a product code has been selected, the machine runs with the parameters stored for that product. For setting the product code, see item 10 in 2.6.

2.5 Password and User Settings

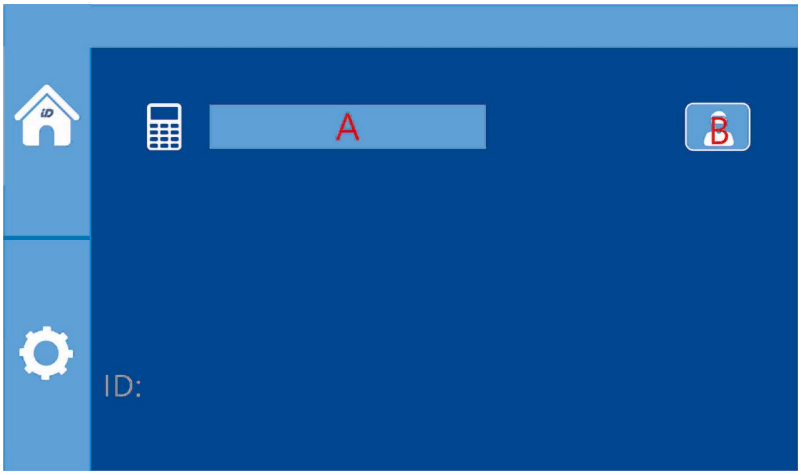


Figure 2-1 ID Page

Both user settings and factory settings require a password (on machines without a password, ignore this).

A is the password area, B is user settings

The user password is 18931226

The password is valid for one hour, that is, it expires after one hour.

Enter the correct password in A to enter user settings; up to 8 digits. The password is kept for only one hour and disappears when the power is switched on again.

The ID code is the number that identifies this machine; it is printed out together with the printout.

Once the correct password has been entered, it remains valid until the machine is switched off. After switching on again, the power-on password must be entered again.

The original password is always valid.

To restore the password, enter 18931226 again; the password becomes valid again, even after a restart.

Enter the password 18931227 to set a password of your own, up to 8 digits.

To cancel the user password, enter 19040822 in CODE; the password becomes invalid, and afterwards all parameters can be adjusted without a password, and no password is needed after switching on again either. The data can easily be tampered with, of course, so we do not recommend this.

> Note: once the password is canceled, anyone can change the sensitivity and other parameters and there is no on-site trace; apart from commissioning and servicing, do not leave the machine without a password for long periods.

2.6 User Parameter Settings Page

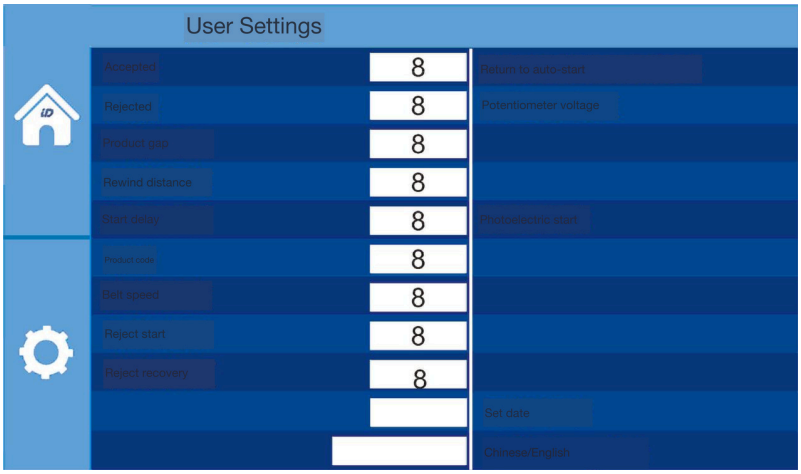


Figure 2-2 User Parameter Settings Page

This page has 14 items; the meaning of each item is given in the table below.

No.	Parameter	Description
1	Accepted count	Double-click to clear.
2	Rejected count	Double-click to clear.
3	Photoelectric gap	The smallest spacing at which the photoelectric sensor can distinguish two items, in centimeters; the smaller the number, the faster the counting response. For creased items, too small a setting causes over-counting, while too large a setting that exceeds the usual gap between products will count two packages as one. Normally set to 5cm.
4	Rewind distance	Distance unit: centimeters; the length of the rewind.
5	Start delay	Unit 10 milliseconds; the delay between machine start and normal detection. If set too short, the machine may not start normally and vibration at start-up easily causes false alarms; if set too long, detection is not available in time just after starting.
6	Reject start time	Unit 10 milliseconds; delay adjustment for starting the reject action when metal is detected. Not effective on machines without this function.
7	Reject recovery time	Unit 10 milliseconds; delay adjustment for the reject device to recover. Not effective on machines without this function.
8	Belt speed	About 30.
9	Return to auto-start after detection	This display indicates the operating mode; there are several operating modes, and the customer taps to select as required.
10	Product type (1-50)	Select the product; up to 50 types, and different products have different sensitivities and modes.
11	Potentiometer voltage	Tap to display the potentiometer data; press the top-left corner to return to the main menu.
12	Photoelectric start	Tap to select photoelectric off.
13	Change date	10 digits starting from the last two digits of the year: year, month, day, hour, minute.
14	Chinese/English selection	—

Note: items 6 and 7 are effective only on models fitted with a reject device; item 9 displays the current operating mode — tap to select as required.

2.7 Quick Operation Reference

The on-screen marks and functions for the operations in this chapter are summarized below; for the positions of the marks in Figure 1-1 and Figure 2-2, see Section 1.3.

Mark	Name	Function
A	Password area (ID page)	Enter the correct password to enter user settings; up to 8 digits.
B	User settings	Tap to enter the user parameter settings page.
C	Settings icon (gear)	Lower part of the left navigation bar; tap to enter Settings.
D	Status strip	A green barred strip when stopped; after start, a green flashing strip when no signal has been detected, a yellow flashing strip when a signal has been detected without an alarm, and a red flashing strip on alarm.
E	Probe signal bar	The E bar shows the probe signal; if the E signal crosses the red line, metal has been detected and an alarm is processed.
F	Product code	Product code 1–50.
G	Numeric display box	Value box on the left of the second row, shown side by side with the sensitivity box.
H	Sensitivity	Press H to enter the sensitivity directly, in percent.
J	Date and time	The date and time are shown in the bottom-right corner of the screen.
—	Start/Stop	Toggle button: while stopped, pressing the button switches it to Start; while running, pressing it switches it to Stop. Green when stopped, red when running.

Mode	Working Method
Mode selection	Tap to select at item 9, “Return to auto-start after detection”, on the user settings page; this machine has several operating modes, and different products have different sensitivities and modes.
Models with motor	After an alarm is detected, rewind by the set rewind distance; the distance unit is centimeters, see item 4 in 2.6.
Models without motor	There is no “rewind distance”; that position shows “alarm length”. The operating modes have no rewind either.

> Note: parameter adjustment is password-controlled; the page order may differ between software versions — follow what the screen actually shows.

Thank you for using our product!

Chapter 3 Installation

3.1 Packing List

After unpacking, check every item listed in the table below against the packing list.

Item	Quantity
Metal detector	1 unit
Operation manual	1 copy
Test piece	Supplied with the machine

> Note: the accessories and documents supplied with the machine are subject to the contract and the packing list; if anything is missing or has been damaged in transport, confirm with the carrier before signing and notify our company.

3.2 Site Requirements

1. The ambient temperature and humidity must be within the range permitted for the equipment, without condensation; for the specific values, refer to the machine nameplate and the contract.
2. No direct sunlight, and no stoves, heaters or other heat-producing appliances nearby.
3. Power supply voltage fluctuations must be within the range permitted for the rated voltage of the equipment.
4. Keep away from vibration sources; the installation position should not be subject to vibration.
5. A location with little dust.
6. No volatile flammable materials, corrosive gases or salt water.
7. Hot or cold air from air conditioning must not blow directly onto the equipment.
8. No moving ferromagnetic objects around the machine (such as electric fans, sewing machines, ceiling-fan motors). Although this machine has interference-suppression circuitry, these should still be avoided.

3.3 Installation Precautions

1. The power supply should form its own circuit, be supplied separately from noise-generating equipment (large motors, packaging machines, high-frequency machines, etc.), and be connected to a nearby socket.
2. Do not split the power cord into several branches or bend it excessively; do not place heavy objects on the power cord, otherwise the conductors may be damaged, causing fire or electric shock.
3. Keep the power cord away from heat-producing appliances. Switch off the power before unplugging, and hold the plug itself to pull it out.
4. When this equipment touches upstream or downstream equipment (such as conveyor belts), it may malfunction due to interference. During installation, avoid contact with other equipment and ground the machine separately.

3.4 Height Adjustment

Adjust the plane of this machine's conveyor belt to the same level as the planes of the upstream and downstream conveyor belts. Adjust the foot bolts so that they make full contact with the floor without wobbling; after adjustment, the lock nuts must be tightened with a wrench.

3.5 Power Connection

1. For safety, a circuit breaker must be installed in the supply circuit; when the machine is used in a damp environment, a ground-fault circuit interrupter must also be installed.
2. To avoid electric shock and ensure stable operation, the power plug must be reliably grounded. The size of the grounding conductor and the grounding impedance must meet the requirements of local electrical codes.
3. The power specification (voltage, frequency, power) is subject to the machine nameplate and the contract; do not connect a supply that does not match the nameplate.

Chapter 4 Routine Maintenance

4.1 Routine Maintenance

When	Task
Before work	Confirm the detection sensitivity with the test piece
After work	Remove the conveyor belt and clean both faces; clear debris between the lower surface of the probe window and the conveyor belt support plate
Weekly	Remove the conveyor belt and check the edges for cracks; check the running condition — there should be no abnormal noise and no creeping (crawling)

Special attention: no debris of any kind is allowed between the lower surface of the probe window and the conveyor belt support plate. Metal chips, thread ends and dust accumulating there will reduce sensitivity or cause frequent false alarms.

4.2 Cleaning Precautions

1. The power plug must be pulled out before cleaning.
2. Use a soft plastic brush or a cloth; never use a metal brush.
3. Clean with a neutral detergent; never use organic solvents such as thinner or benzene.
4. Rust marks caused by metal powder or salt can be wiped away with a sponge or cloth soaked in neutral detergent or soapy water, then rinsed thoroughly with clean water; cleaning liquid must not be left on the equipment.
5. If stains from fingerprints or touching cannot be removed completely with neutral detergent or soapy water, wipe them with a sponge or cloth containing an organic solvent (alcohol, gasoline, acetone, etc.).
6. This machine must not be washed with water. The conveyor belt, the detection probe and the electrical box must be kept dry.
7. After long periods out of use, or when summer humidity is high, wipe the condensation off the conveyor belt, the support plate and the electrical box before switching the machine on.

4.3 Drive Section and Gear Reducer

1. A horizontal gear reducer with grease lubrication is used. During operation, watch the temperature rise and noise of the reducer; if any abnormal sound occurs, stop the machine and inspect it immediately.
2. The reducer can be used indoors and outdoors in various situations; the working ambient temperature must be within the range permitted for the equipment.
3. The reducer is filled with grease at the factory. A newly installed reducer loses grease in operation; top up the grease as soon as possible after first use, and top it up promptly and often thereafter, to ensure normal operation and extend the service life.
4. Thereafter, clean and change the oil periodically according to the intensity of use; where working hours are long or conditions are harsh, shorten the oil change interval as appropriate. The frame bearings are grease-lubricated and should be included in the periodic maintenance plan and topped up on schedule.
5. Check the drive section periodically and add oil; tighten the fastening screws if they have loosened.

Chapter 5 Troubleshooting

5.1 Fault Symptoms and Remedies

Clearing electrical faults must be done with the power switched off, and must be carried out by a suitably qualified electrician. For faults not listed in the table below, contact our company or your dealer; do not dismantle the electrical box yourself.

No.	Symptom	Possible Cause	Remedy
1	No reaction at all after the power switch is pressed; the power indicator lights intermittently	No power supply; blown fuse; poor contact of the power cord or socket	Check the power supply and the contact of the power cord and socket; replacement of the fuse must be carried out by qualified personnel

No.	Symptom	Possible Cause	Remedy
2	After switching on, with no product placed on the belt, the status strip changes color or alarms irregularly	Sensitivity too high; conveyor belt or probe window dirty; interference from external magnetic fields or moving iron objects; power supply interference	Lower the sensitivity and re-check with the test piece; clean off the dirt and wipe both faces of the conveyor belt with alcohol; check for moving iron objects and ceiling-fan motors around the machine; improve the supply circuit
3	The alarm sounds only intermittently when the test piece is placed	Sensitivity too low; debris on the lower surface of the probe window; the water content of the product itself or its packaging	Raise the sensitivity appropriately and re-check with the test piece; clear the debris; re-confirm the settings for the actual product
4	Inaccurate counting, over-counting or under-counting	Photoelectric gap set too small or too large; photoelectric window obstructed	Adjust the photoelectric gap setting to the actual gap of the product; clean the photoelectric window
5	The conveyor belt runs off to one side, slips, or makes an abnormal noise in operation	Uneven conveyor belt tension; foreign matter on the rollers or drive parts; loose fasteners	Adjust the tension, clear the foreign matter and tighten the loose parts; if it is still abnormal, stop the machine and call for repair
6	After switching on, with no product placed on the belt, the status strip changes color or alarms regularly	Conveyor belt dirty; iron chips embedded in the conveyor belt; external interference	Scrub both faces of the conveyor belt with alcohol or a damp towel; remove the embedded iron chips; move the equipment to a place free of interference

Note: the sensitivity must be re-checked with the test piece after adjustment. Products already inspected while the equipment was running with a fault must be re-inspected; this cannot be skipped merely because “the machine has been repaired”.

5.2 Inspection Practice and Re-inspection Rules

The following items are quality control requirements for metal detection work; they bear directly on the risk of missed detection and must be carried out.

1. Before every inspection, first calibrate the sensitivity once with the supplied test piece, and start inspecting only after confirming that the equipment is normal.
2. During inspection, calibrate the sensitivity once every hour with the supplied test piece. If the equipment is found to be malfunctioning, stop inspecting immediately; after clearing the fault, recalibrate the sensitivity and continue only after confirming that it is normal. All products already inspected during the fault must be re-inspected.
3. Place and remove items gently; do not throw or drop them, to avoid false alarms caused by vibration.
4. Any product that triggers an alarm must be re-inspected once; if it still alarms, it is judged to contain metal foreign matter, which must be identified and removed, and re-inspection continues until no alarm occurs.
5. The products being inspected must not extend beyond the detection channel; striking the detection probe will cause false alarms.
6. If an abnormal noise occurs during operation, stop the machine and inspect it immediately, and resume inspection only after the fault is cleared.
7. The detection probe must be kept stable: do not stack anything on the probe and do not lean on it while working.
8. An occasional single alarm caused by vibration or power fluctuation is normal and is not treated as a fault; if it occurs frequently, troubleshoot according to Chapter 5.
9. After every inspection, stop the machine, switch off the main power and pull out the power plug.

Chapter 6 Safety Instructions

1. The power plug of this machine is a single-phase three-core type; the socket must match it and must provide reliable grounding and neutral protection (wired in the manner required by the local power authority).
2. If the user needs to replace fuses or other electrical components, the power must be switched off first to prevent electric shock.
3. Electrical repairs must be carried out by suitably qualified professionals, to ensure the safety of persons and property.
4. Do not put hands or tools into the detection channel or the drive parts while the equipment is running.
5. The power plug must be pulled out before cleaning or removing the conveyor belt.
6. The equipment must be reliably grounded before power is applied.

Appendix 1 Daily Verification Record

Before every start of work and during inspection, verify the sensitivity with the test piece as required in 5.2, and record the verification results in this table.

Date	Sensitivity Setting	Test Piece Result (Normal/Alarm)	Equipment Status	Checked By	Remarks

Note: this table is completed and kept by the user as the quality record of the inspection process.

Appendix 2 Product Warranty

Dear user: First of all, thank you for choosing our product. To make our service more satisfactory to you, and in your own interest, please fill in this form carefully after purchase and keep it in a safe place.

> The product name, model specification, product serial number and date of manufacture are as marked on the machine nameplate.

Customer name	Date of purchase
Contact person	Telephone
Address	Product name
Model specification	Product serial number
Dealer name	Dealer stamp

Warranty Terms

1. Warranty period: one year (from the date of purchase).
2. The conveyor belt is a wear part and is not covered by the free warranty; users may contact the dealer to purchase a replacement.
3. In any of the following cases the free warranty does not apply, and our company is entitled to charge repair costs:

· beyond the valid warranty period;
· damage caused by force majeure (flood, fire, earthquake, lightning, typhoon, etc.) or by improper operation or use;
· inspection, repair, modification, component change or circuit alteration carried out by the user or by a third party without authorization;
· the warranty form has been altered, or does not correspond to the product.

4. Products exported to overseas regions are not entitled to free warranty service; please consult the dealer about paid repair service.
5. Users should read this manual thoroughly and operate as specified. After purchase, please return this form to our company (or send a photo of it) for our records as soon as possible.

Manufacturer Information

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