



]

NeedleFinder™

Metal Detection System

User Manual



Model: NF-4



Model: NF-4D

Version 1.0

Mar 2018

NEEDLEFINDER USER MANUAL

VERSION 1.0

APRIL 2018

COPYRIGHT © 2006-2018 HCL ASIA LIMITED. ALL RIGHTS RESERVED.

NO PART OF THIS PUBLICATION MAY BE REPRODUCED, STORED ON A RETRIEVAL SYSTEM, OR
TRANSMITTED IN ANY FORM WITHOUT THE PRIOR PERMISSION OF HCL ASIA LIMITED

ATTENTION:

**Read carefully the user manual before
connecting and operating this needle detector.**

ELECTRIC SAFETY NOTICE

To prevent fire or shock hazard, do not expose the unit to rain or moisture. To avoid electrical shock, do not open the control box or front panel. Refer servicing to qualified personnel only.



QMAX-REHOO brand was first launched in January 2018. Our manufacturing plant is located in Shanghai since 1990s with 10,000 square meters work space to-date.

QMAX is a trademark registered and solely distributed by HCL Asia Limited unless with its authorization.

QMAX brand name is created and owned by:

HCL ASIA LIMITED

Unit 14, 6/F., Worldwide Industrial Centre,
43-47 Shan Mei Street, Fotan, Shatin
Hong Kong

T: +852 27420018

F: +852 27420053

E: info@hcl-asia.com.hk

www.hcl-asia.com.hk

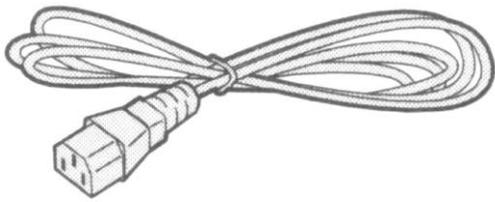
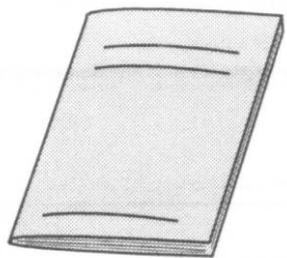
Your local agent:

TABLE OF CONTENTS

1. PREPARATION	5
1.1. ATTACHED ACCESSORIES	5
1.2. FUNCTIONAL PARTS	6
1.2.1. Machine Layout	6
1.2.2. Installation and Fixture	7
1.2.3. Power Supply	8
2. BASIC OPERATIONS	9
2.1. CONTROL PANEL DESCRIPTION	9
2.2. INITIALIZATION INTERFACE	9
2.3. REAL-TIME MONITORING INTERFACE	10
2.4. SENSITIVITY BAR GRAPH.....	10
2.4.1. SENSITIVITY SETTING	11
2.5. B / C / TEST MODE.....	11
2.6. ALARM SETTING.....	12
3. SYSTEM SETUP INTERFACE	12
3.1. REJECT SETTING	13
3.2. CALIBRATION SETTING	13
3.3. TIME SETTING	14
4. MAINTENANCE	15
4.1. CONVEYOR BELT ADJUSTMENT.....	15
4.1.1. Operation Guidance	15
4.2. SAFETY NOTES	16
4.2.1. Important Safety Notes	16
4.3. OTHER PRECAUTIONS	17
4.4. ROUTINE MAINTENANCE	18
4.5. TROUBLESHOOTING.....	20
4.6. SPECIFICATIONS.....	22
4.6.1. DETECTION STANDARD	22
4.6.2. MACHINE PARAMETERS.....	22
4.6.3. TAILOR-MADE APERTURE SIZE	22
4.7. CONTACT US.....	23

1. PREPARATION

1.1. ATTACHED ACCESSORIES

	
<p>Power cable 1 pc</p>	<p>Spanner 1 pc</p>
	
<p>Operating manual 1 pc</p>	<p>Ferrous test sample 1 pc</p>

- Contact your local dealer if any accessory is absent or damaged.
- Keep the original wooden packing for future use if any.

1.2. FUNCTIONAL PARTS

1.2.1. Machine Layout

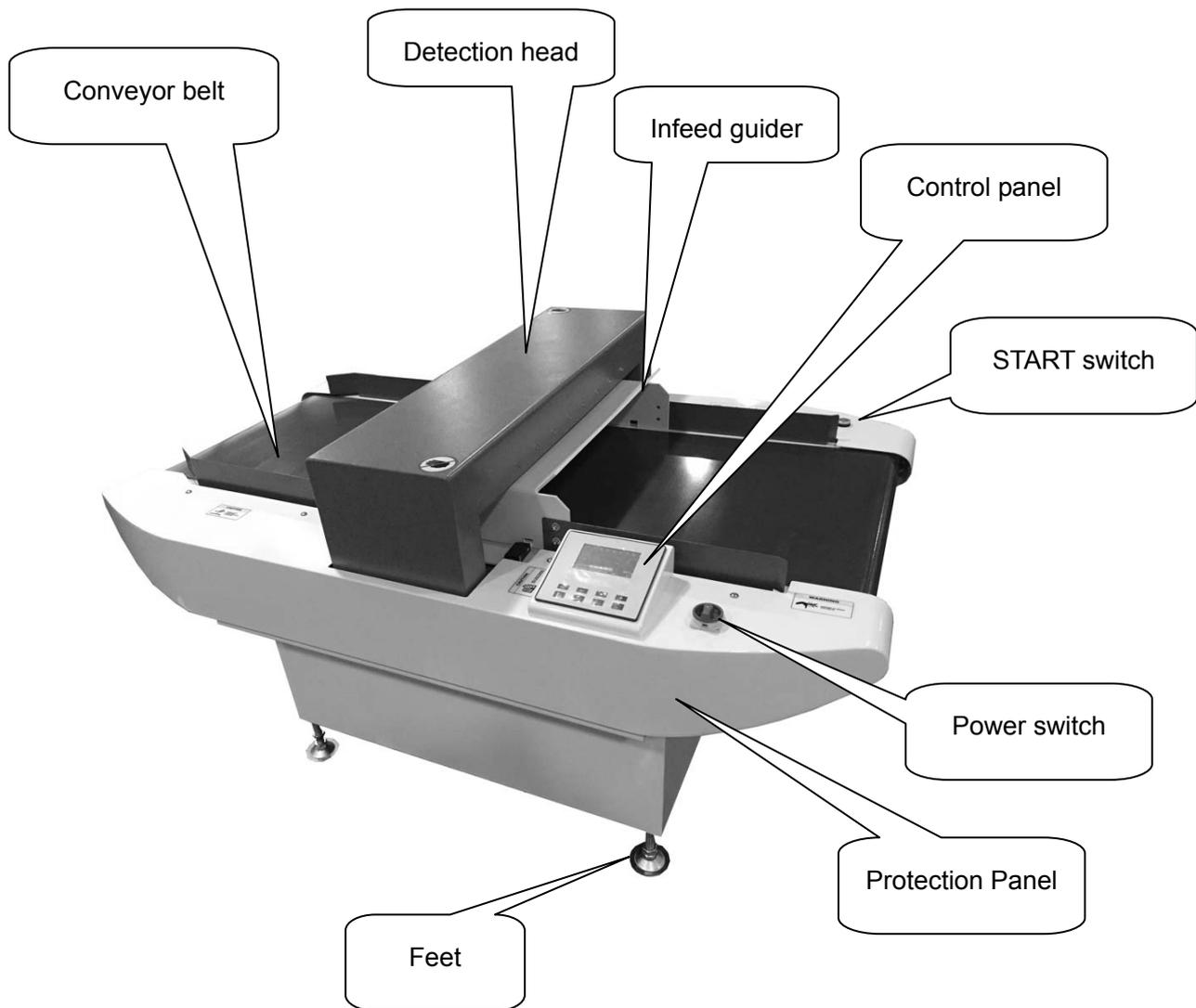


Fig. 1 Machine Layout

1.2.2. Installation and Fixture

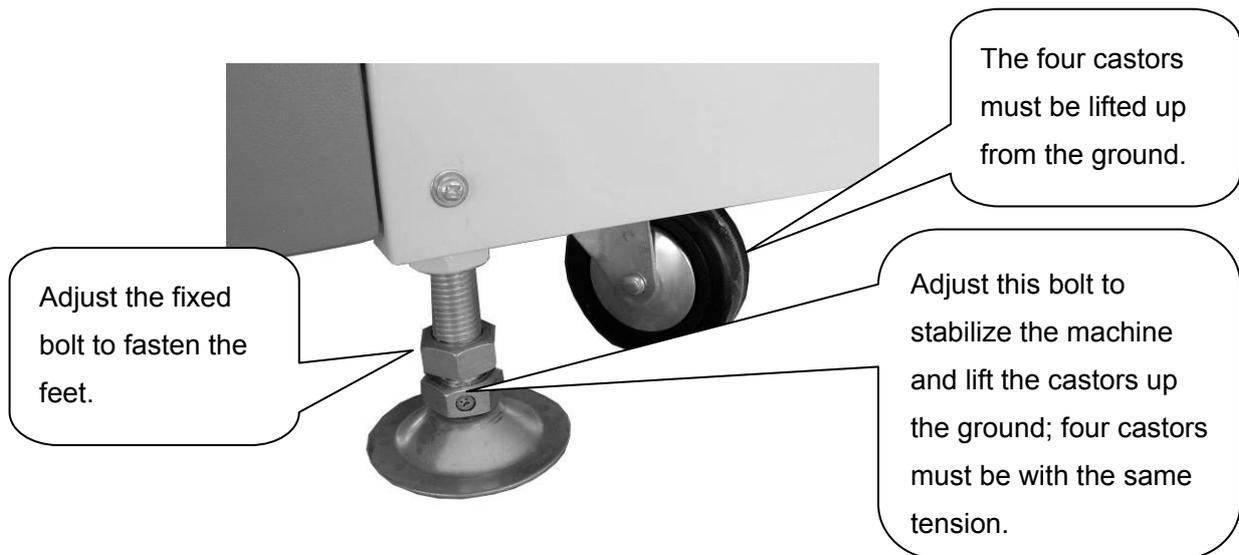


Fig. 2 Castor and Feet Adjustment

- Before operation, machine must be placed on a level ground without any potential vibration. The four fixed bolts must be adjusted until the whole machine is fitted steadily & horizontally and four castors must be lifted up from the ground. In addition, the fastening screw must be tightened. Otherwise, the conveyor belt may be deviated.
- Machine must not be placed on or near an iron platform or iron rack.
- Machine must be kept away from any devices that may produce magnetic signal such as clutch motor, sewing machine, fabric cutter, packing machine, air-con, transformer, high-voltage electric fan or any revolving device, which may produce electric and/or magnetic interference and thereby contribute to malfunctioning.
- Machine must be kept away from any big moving metals, e.g. trolley.
- Machine must be kept in a condition between 0°C and 40°C and must not be under 0°C the freezing point.
- Severe dust, metal powder, moisture or dew must not be present in the machine area.

1.2.3. Power Supply

- Voltage: AC100V-240V (single-phase); 50-60Hz (AC220V/50HZ standard motor will be supplied as default unless otherwise mentioned).
- A socket must be fitted with solid grounding (earth) connection. AC power supply must be compatible with the motor specifications.

Notes:

	<p>Do not share the socket with other electric devices. Check the power voltage before use.</p>
	<p>In case if an extension cable is required, do not share the socket with other electric devices to avoid potential damage or interference caused.</p>
	<p>Check the power voltage supply before use. If any doubt, consult with your local electricity provider. Wrong voltage can cause damage to the machine, which will void the warranty.</p>

2. BASIC OPERATIONS

2.1. CONTROL PANEL DESCRIPTION

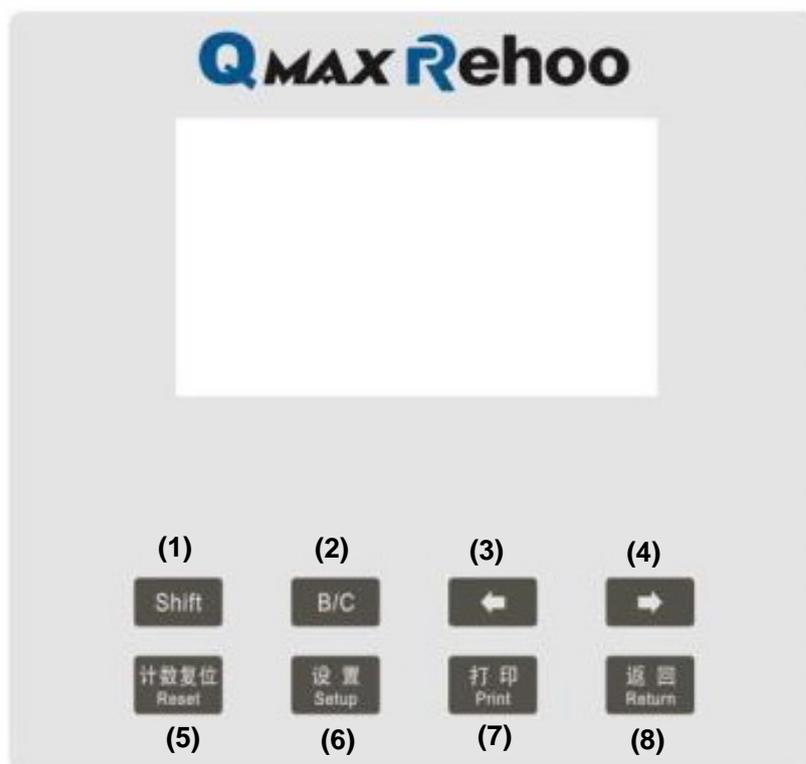


Figure 1 Control Panel

2.2. INITIALIZATION INTERFACE

When the machine is powered on, it goes to Initialization Interface (see in Figure 2). The below picture shows a processing bar with current language. Press Button (1) **[Shift]** (see Figure 1) momentarily to select Chinese or English language if desired. Other buttons are inactive.

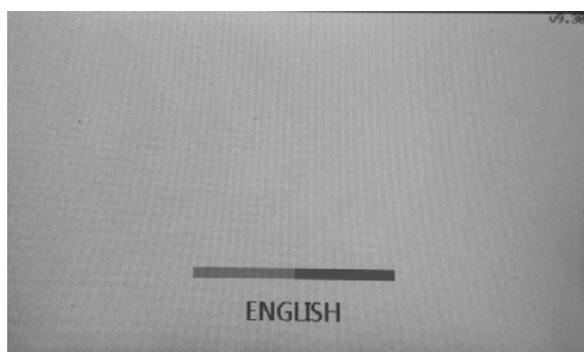


Figure 2A – English



Figure 2B – Chinese

2.3. REAL-TIME MONITORING INTERFACE

After initialization, needle detector access to real-time monitoring interface (see Figure 3).

- The top row shows the current metal signal of 8 detection channels.
- The second row shows current sensitivity bar graph.
- The bottom row is current data. From left to right shows: Date/Time, B/C mode, Auto Start, Total.

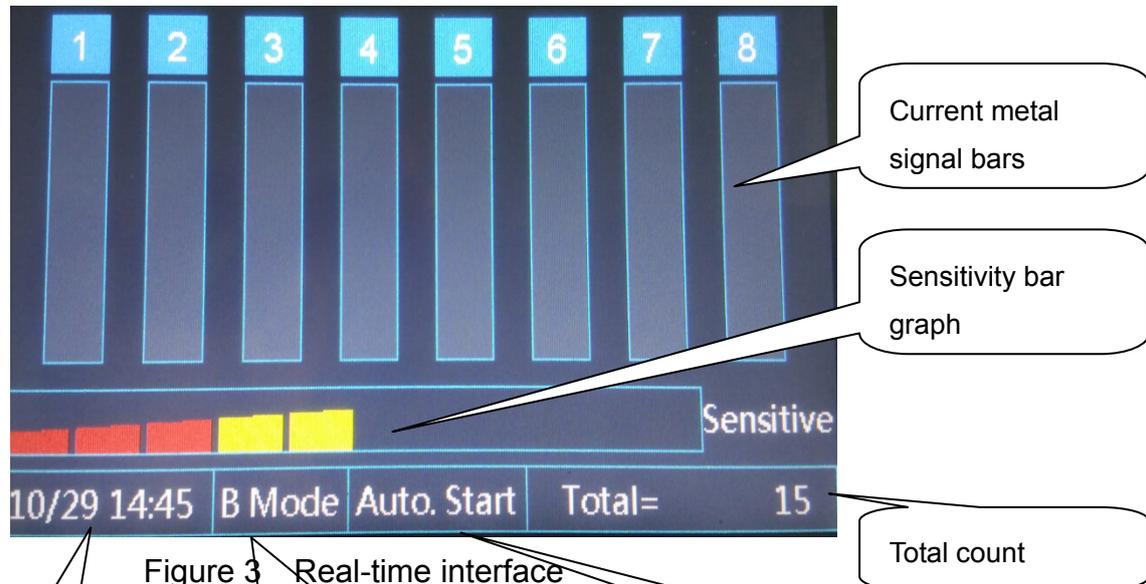


Figure 3 Real-time interface

Date / Time

Auto Start

Mode B / C / TEST

B: counter is activated (standard mode)
 C: counter is de-activated (calibration mode)
 TEST: first detector head is de-activated for calibration on the second detector head
(applicable for machine model NF-4D only)

2.4. SENSITIVITY BAR GRAPH

Sensitivity bar graph indicates the level sensitivity setting. It has 11 levels, rating from 0 to 11. The greater the number, the higher the sensitivity.

- Level 0 means sensitivity is set to zero and all products will pass through without triggering any alarms
- Level 1 is set to detect FE Φ 1.5mm
- Level 4 is set to detect FE Φ 1.2mm
- Level 7 is set to detect FE Φ 1.0mm
- Level 10 is set to detect FE Φ 0.8mm.

Please refer to Figure 4.

2.4.1. SENSITIVITY SETTING

Press Button (3) or (4) to adjust sensitivity (see Figure 1)

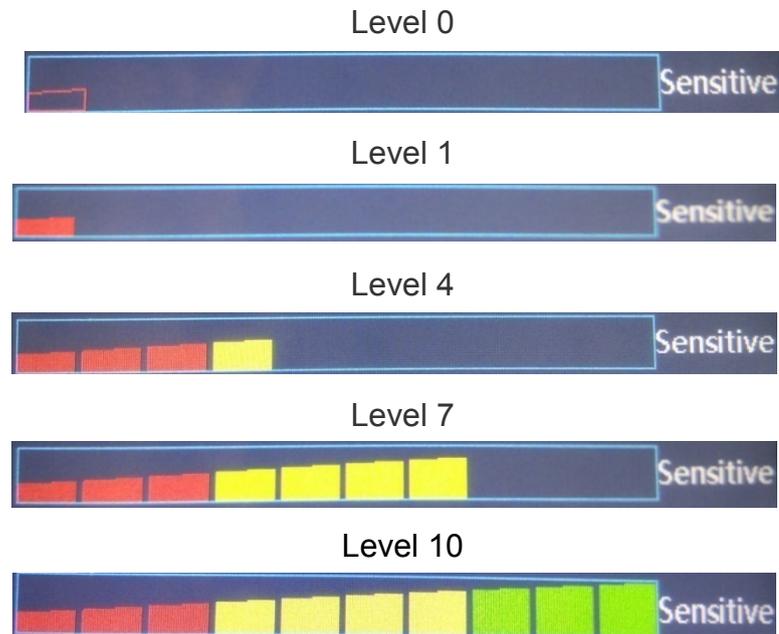


Figure 4 sensitivity setting

2.5. B / C / TEST MODE

Press Button (1) [**Shift**] (see Figure 1) to select different mode.

- B mode refers to photo-sensor active mode. Only when a product passes across the photo-sensor (located at the entrance of the aperture), detection is then activated and counted. It is suitable for flat and regular products.
- C mode refers to photo-sensor inactive mode. Product counting is inactive under this model. This model is recommended for detecting very thin objects, including laminated ferrous test card, if any.
- TEST model refers to turning off the first detection head on demand when calibrating the second detection head (applicable to dual-head model NF-4D only) is required.

Under B mode, press Button (1) [**Shift**] to alter the counting type, showing Total →, NG → Pass.

Under C mode, counting type is only showing: Alarm.

WARNINGS: Under all circumstances, NEVER put any products onto conveyor belt before pressing [**START**] button. Laying products onto the conveyor belt before press [**START**] will result in mal-detection.

2.6. ALARM SETTING

When ferrous signal found in product exceeds the sensitivity setting level, alarm will sound (see in Figure 5). The buzzer will alarm 5 times and LED light will blink and the corresponding detection bar graph show full and red (see Figure 5) and the conveyor belt will stop according to user's setup.

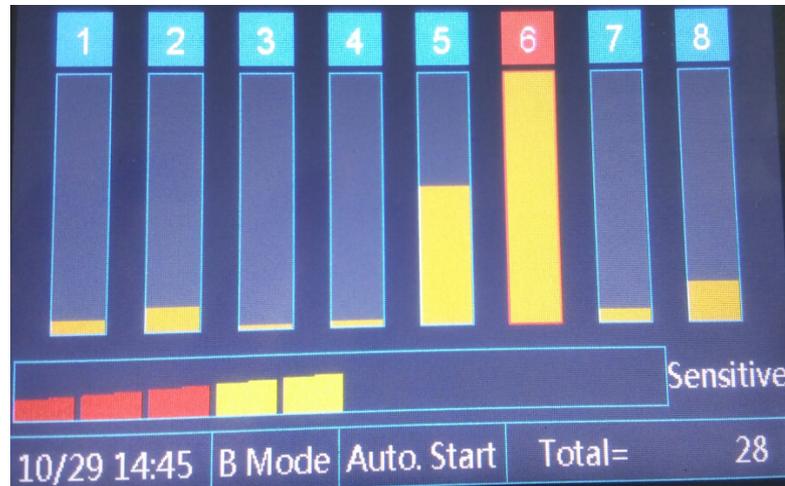


Figure 5 Alarm setting

3. SYSTEM SETUP INTERFACE

Press Button (6) **[Setup]** to access to system setup interface. Press [Shift] (1) to navigate through setup menu options. Press setup (6) again to enter the selected menu. Press return button (8) to get back to the previous interface (see Figure 6) if desired.



Figure 6 System setting

3.1. REJECT SETTING

Reject refers to the options of the conveyor belt when alarm is triggered, ranging from Stop → Non-stop → Reverse → Auto Start (see Figure 7).

Press left button (3) and right button (4) to select options.

- **Stop** means when alarmed, belt will stop instantly
- **Non-stop** means when alarmed, belt will not stop
- **Reverse** means when alarmed, belt will reverse and stop
- **Auto Start** means when alarmed, belt will reverse and will not stop

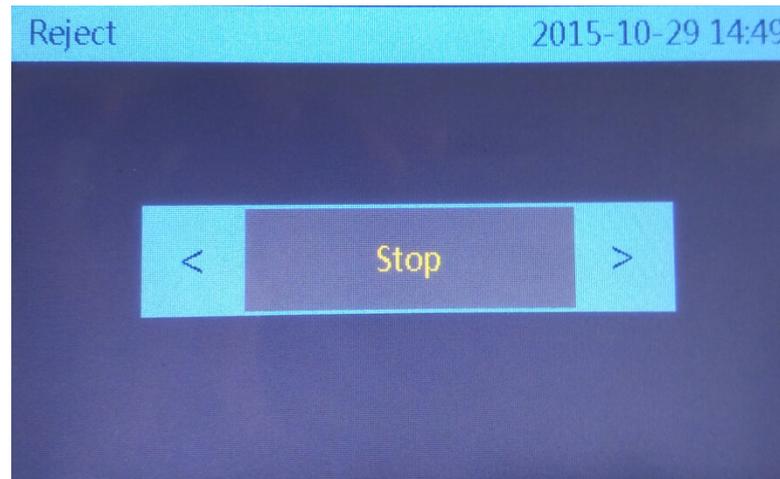


Figure 7 Reject setting

3.2. CALIBRATION SETTING

Calibration is to calibrate the sensitivity of 8 detecting channels. In most circumstances, **users are not recommended to amend any of these settings.** Amending this setting may cause machine malfunctioning (see Figure 8).

There are two parameters to adjust for each detecting channel (tunnel 1 to 8): Offset (mV) and Gain (X). Value range is:-200~200 and 0.80~1.20 respectively.

Select Tunnel number 1 to 8 as desired. Press [shift] (1) to select the parameter for adjustment. Press left (3) and right button (4) to adjust the parameter value. .

WARNINGS: If machine sensitivity is below user's expectation, user can increase the "Gain (X)" slightly until satisfied.

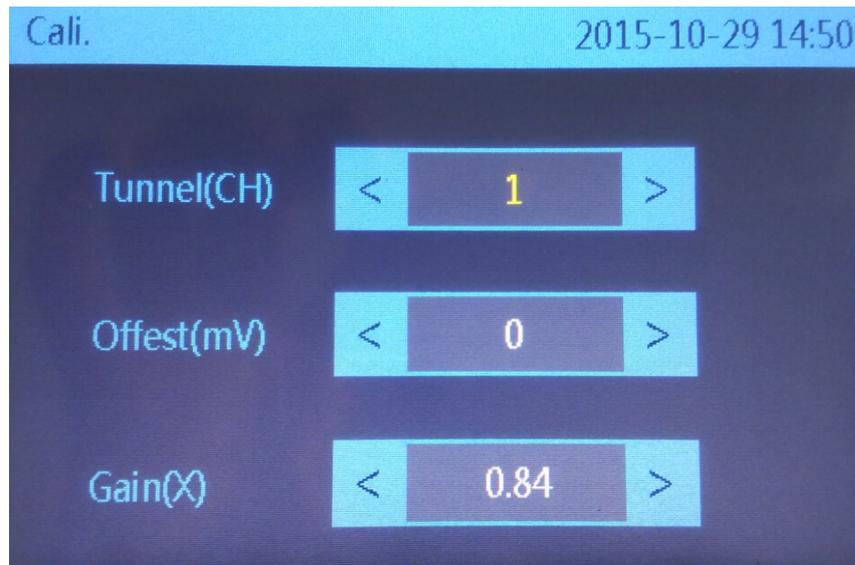


Figure 8 Calibration setting

3.3. TIME SETTING

“Time” is to adjust date and time (see Figure 9). Press Shift button (1) to navigate through the desired parameters from Year → Month → Day → Hour → Minute → Second. Press left (3) and right button (4) to adjust the value.

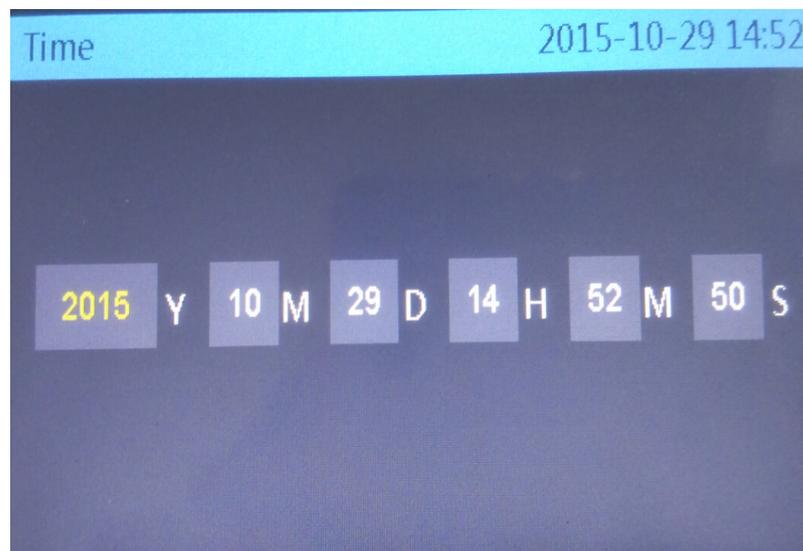


Figure 9 Time setting

4. MAINTENANCE

4.1. CONVEYOR BELT ADJUSTMENT

4.1.1. Operation Guidance

- In case of *deviation* of the conveying belt, adjust the screw (see below picture) by using an Allen key as seen in below picture. The screws are located on the infeed side of conveyor, where the operator places the product onto the conveyor for detection. If the belt deviates toward right, tighten the right screw clockwise (*or slightly loosen the left screw*) for a half-turn (180°). If the belt still cannot return to the center, adjust the screw clockwise for another half-turn (180°). ***Be noted that when the front and the back rollers are parallel to each other, the belt will tend to deviate or move towards the loose side.***
- In case if the conveyor belt appears curvy or uneven, the belt should be loosened slightly.



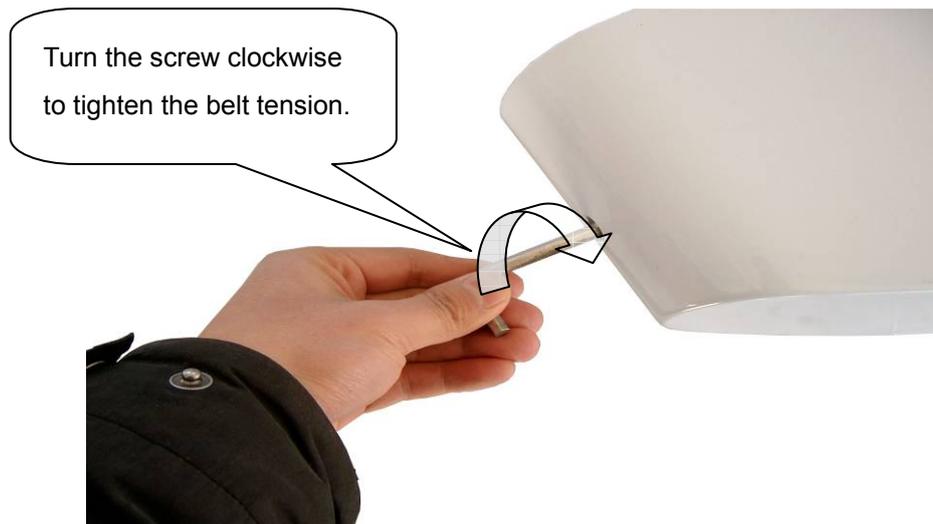


Figure 10 Conveyor Belt Adjustment

4.2. SAFETY NOTES

4.2.1. Important Safety Notes

The following safety measures shall be taken for the machine operation to reduce the risks of fire accident, electric shock or human injury.

1. Read and understand all notes.
2. Operate in accordance with alarms and notes on the machine.
3. Disconnect the machine power before cleaning. Do not use liquid or spray cleaner. Use wet cloth with or without soapy liquid / detergent.
4. Keep the machine away from water.
5. The machine must be laid on the floor horizontally to avoid potential damage or human injury.
6. Machine working environment must be ventilated. Avoid over-heating of the machine. Keep the machine away from radiator or non-ventilating position.
7. Power supply voltage must comply with the machine. If any doubt, contact your local dealer or power supply bureau.
8. Grounding of the machine is imperative to avoid risks of damage or human injury. The machine is equipped with a standard plug having grounding function. User must use sockets with grounding. Other plugs or sockets without grounding will void the warranty of the machine.
9. No pressing on the power cable. Installation position of the machine shall ensure no trample on the power cable and no stumble against humans.
10. Never overload the wall socket or the extension cable to avoid possible fire accident / electric shock.
11. Do not insert any object or any part of the body into the machine to avoid machine

failure or working accident.

12. Never remove the machine in case of electric shock. When inspection is required, please contact local dealer or after-sales service center. Removal or takedown of the enclosure may cause danger if you touch the voltage or other dangerous parts. Incorrect re-assembly may cause machine failure or electric shock accident.
13. Disconnect the plug and contact local dealer and after-sales service center when the following circumstances happen:
 - a) When the power cable or plug are damaged or worn;
 - b) When liquid is sprayed in the machine;
 - c) When the liquid undergoes rain or water;
 - d) When the machine undergoes high temperature or fire accident;
 - e) The machine fails to work even when the operation procedure is according to the user manual;
 - f) When the machine has fallen or the machine is damaged;
 - g) Dramatic change of the machine performance during operation.
14. Avoid operating the machine under lightning; otherwise, it may be damaged.



4.3. OTHER PRECAUTIONS

- Keep the machine away from electric appliance that may produce magnetic interference, e.g. electric welding machine, transducer, etc.
- Keep the machine away from dust, high temperature and vibration.
- Never expose the machine directly under sunlight.
- Never pile heavy articles on the machine.
- Never use wet hands to touch the plug.
- It is suggested that exclusive stylus pen should be used to operate the touch-screen and avoid use sharp article to touch the screen.
- Test the machine with a standard ferrous test piece before use. The machine buzzer will sound and the belt will stop under normal operation.
- The machine can detect ferrous metal and / or product with iron content.

However, non-ferrous items such as aluminum, copper, etc. will not be detected.

- The machine will react to the moving metals. So, operator shall not wear metal ornamental article in the course of machine operation.

4.4. ROUTINE MAINTENANCE

- Keep the conveyor belt clean and dust-free and metal-free at all times. Check if any broken needles, rust, iron filings, small iron puncture, metal fragment, oil stains, etc, are found on the conveyor belt on a regular basis. Clean the belt with a wet cloth with non-abrasive detergent or soapy water.
- Make sure no metal fragments are kept inside the aperture to avoid metal disturbance.

Guidance for cleaning the belt



Clean the belt horizontally

When using cleaner or rust remover, operator must wear protective gloves. Do not touch directly the liquid with hands to avoid skin injury



When cleaning, the cloth must pass across the belt from one side to another. In addition, the cloth must move up and down, right and left. During cleaning, power must be off.

Figure 11 Cleaning of Conveyor Belt

4.5. TROUBLESHOOTING

Problem	Possible reason(s)	Solutions
Machine failure	<ul style="list-style-type: none"> No power supply 	<ul style="list-style-type: none"> Check the mains, the socket, the plug, the cable connection.
	<ul style="list-style-type: none"> Fuse is blown 	<ul style="list-style-type: none"> Replace 10A fuse (inside the control box)
	<ul style="list-style-type: none"> Power switch failure 	<ul style="list-style-type: none"> Replace this type of switch
Conveyor belt failure	<ul style="list-style-type: none"> The belt is too loose 	<ul style="list-style-type: none"> Tighten the screw slightly
	<ul style="list-style-type: none"> Electric wire is loose 	<ul style="list-style-type: none"> Check the wire connection
	<ul style="list-style-type: none"> Relay is damaged 	<ul style="list-style-type: none"> Check the socket cable or replace the relay
	<ul style="list-style-type: none"> Driving plate is damaged 	<ul style="list-style-type: none"> Replace the driving plate
	<ul style="list-style-type: none"> belt is deviating 	<ul style="list-style-type: none"> For deviating towards right, tighten the right screw clockwise or slightly loosen the left screw for half circle of the infeed side. If the belt still is not returning to the center, adjust the screw clockwise for another half-circle or vice versa.
	<ul style="list-style-type: none"> Belt is curled 	<ul style="list-style-type: none"> Adjust the belt Loosen the belt. Note: Slight deviation will not affect the operation since guard ring for the belt is mounted on the support axle.
False alarm	<ul style="list-style-type: none"> The belt is metal contaminated. 	<ul style="list-style-type: none"> Clean the belt thoroughly in and out Replace the belt when necessary
	<ul style="list-style-type: none"> Interference around the machine 	<ul style="list-style-type: none"> Remove all potential interference or keep away from interference source Relocate the machine or change the machine orientation.
	<ul style="list-style-type: none"> The machine is not installed properly 	<ul style="list-style-type: none"> Check the machine bolt on the floor. Machine must be laid horizontally on the solid floor.
	<ul style="list-style-type: none"> Sensitivity too high 	<ul style="list-style-type: none"> Lower the sensitivity accordingly.
	<ul style="list-style-type: none"> Roller bearing is carrying magnetic signal 	<ul style="list-style-type: none"> Replace new bearing

Trouble	Possible reason(s)	Trouble-shooting
Detection failure	<ul style="list-style-type: none"> • Sensitivity setting is too low • Strong magnetic interference on power supply 	<ul style="list-style-type: none"> • Increase the sensitivity accordingly. • Remove interference from the machine. • Check power cable connection to ensure the wiring position inside the plug is correct. Check grounding cable. • Relocate the machine.
Counter failure	<ul style="list-style-type: none"> • Tested products are too thin or too low to activate the infrared sensor (less than 2 cm) • Tested products are translucent or transparent • Photo-sensor emitting signal is not received properly • Photo-sensor emitter is damaged 	<ul style="list-style-type: none"> • Fold the tested product • Add more pieces together for detection so that the height reaches the counting sensor. • Deactivate the counter function • Adjust the direction of the sensor • Replace the sensor
Other troubles		<ul style="list-style-type: none"> • Refer to the user manual instruction • Contact your local dealer or after-sales service provider

4.6. SPECIFICATIONS

4.6.1. DETECTION STANDARD

Aperture height	Detection sensitivity	Remarks
120 mm	Ferrous sphere \varnothing 0.8 mm	Standard
150 mm	Ferrous sphere \varnothing 1.0 mm	Customized
200 mm	Ferrous sphere \varnothing 1.5 mm	Customized

4.6.2. MACHINE PARAMETERS

1. Power source: AC 100V - 240V \pm 10% (single phase); 50-60 Hz.
2. Power consumption: 90W approximately
3. Aperture width: 600 mm
4. Belt speed: 24m/min
5. Detection method: magnetic induction
6. Detection sensitivity: ferrous sphere \varnothing 0.8 mm
7. Alarm method: buzzer
8. Machine dimensions: 1,650 mm(L) \times 1050 mm(w) \times 970 mm(H)
9. Net weight: 240 Kg

4.6.3. TAILOR-MADE APERTURE SIZE

Tailor-made aperture size is available at production. Available aperture height ranging from **120 to 300mm** and aperture width ranging from **600 to 2000mm** can be manufactured upon buyer's request when ordering. It is subject to manufacturer's final confirmation.

Note:

The above specification or parameters are based on the standard test condition. The sensitivity can be affected by inherent product (e.g. trimmings) and workplace condition. We bear no responsibility in case of metal chips found during metal detection process.

4.7. CONTACT US

4.7.1. HEAD OFFICE

HCL ASIA LTD.

Unit 14, 6/F., Worldwide Industrial Centre,

43-47 Shan Mei Street, Fotan, Shatin, Hong Kong

Tel: +852 27420018 Fax: +852 27420053

Email: info@hcl-asia.com.hk www.hcl-asia.com.hk

4.7.2. LOCAL AGENT

