



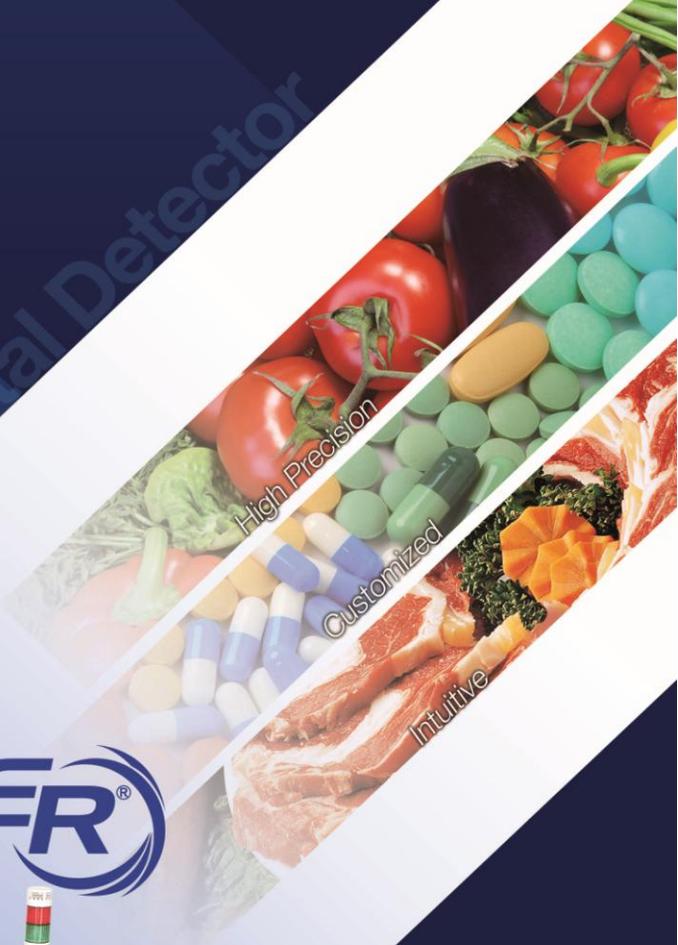
It's manufactured in Korea



INNOBIZ  
기술혁신영증소기업



Smart Metal Detector



High Precision

Customized

Intuitive

# SEEKER®



**NOW SYSTEMS** Total Inspection Systems & solution  
**NOW SYSTEMS CO., LTD.**  
[www.nowsystems.co.kr](http://www.nowsystems.co.kr)

# The advantages are as follows

## ◆ With the multi-frequency detection mode, a wide range of products can be tested.

High-frequency signals used for the inspection can be chosen depending on the properties of a product for the inspection, so one metal detector provides the optimal detection performance for the various products for test.

## ◆ Supports the automatic setting function

It is easy to use since setting sensitivity and phase to effectively remove the impact of the product for inspection can be made by auto setup process.

## ◆ Convenient wide touch screen operation

A variety of device operating information including help is displayed on the 7-inch screen, so even a beginner has easy access to operate the equipment.

## ◆ With excellent durability, it can be used for a long time

With a durable structure without deformation under vibration, shock & heat shock, it maintains stable detection performance for the prolonged use.

## ◆ Support a wide variety of additional functions

Various features such as self-diagnosis, detection history storing, using optional printer, ethernet connection, USB Disk accessibility, various rejecting systems, others and etc.,

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It is the precautions to prevent accident or risk by using a product safely and properly.



## Warning

In case any violation of instruction might result in serious injury or death

- Please make sure to plug the power cord to an outlet with waterproof.
  - There is a risk of fire and injury caused by an electric short circuit.
- Please do not disassemble the machine discretionally while power is on.
  - There is a risk of injury by electric shock and fire by electrical short circuit.
- Please do not clean the machine with flammable substance.
  - There is a risk of injury due to fire
- Please do not damage the power cord, and when the outlet is loose, please stop using the machine.
  - If the electrical connection is unstable, there is a risk of heat and ignition.



## Cautions

In case any violation of instructions might result in minor injury or failure of the machine

- Please do not press the touch screen with sharp tools or nails.
  - Any failure of waterproof is might result in malfunction of the machine.
- Please prevent any excessive changes in temperature.
  - Sudden changes in temperature might result in a fatal failure of the machine.
- Please install the machine by avoiding a heating element and direct sunlight.
  - Excessive temperature change inside the machine might result in a fatal failure of the machine.
- Please avoid installation in a place with strong vibrations
  - It may cause a malfunction.
- Please avoid installation around the high-frequency generator
  - Electrical conduction and radiating noise might result in malfunction of the machine.
- Please be sure to connect the ground wire.
  - It may result in electric shock due to electric leakage.

■ Any person other than designated technicians and the personnel authorized by NOWSYSTEMS is not allowed to disassemble or repair / modify the product.

(There is a risk of fatal injury and if after sales service is required, repairs will be made at cost even within the warranty period.)

A metal detector is an inspection equipment to detect metal contaminants such as ferrous, stainless steel and etc.. non-normally incorporated in the products.

The metal detector is applied to the following areas:

## Food Processing

To screen the presence of metal contaminants that a human or an animal should not consume mainly in food.



Instant foods



Pharmaceuticals



Meat products



Agricultural and fishery products



Confectionery and Bakery sector



Feedstuff

## Clothing / Shoes / Sewing sector

To screen mainly a piece of metal that causes the trauma of the human body.



Clothing



Stuffed toys



Shoes

## Industrial Area

To screen metallic impurities in the raw materials and finished goods for protection of production machinery



Rubber

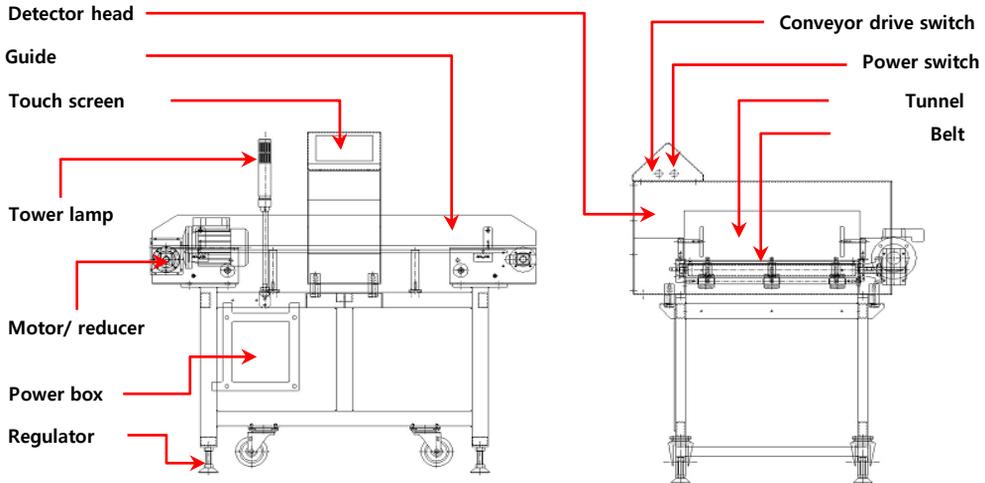


Chemical



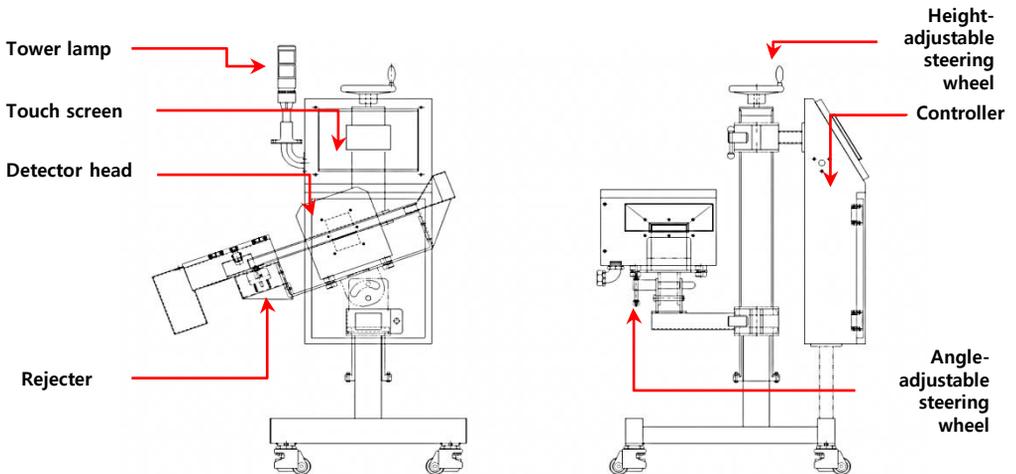
Recycling products

## Structure and name of each parts for conveyor types



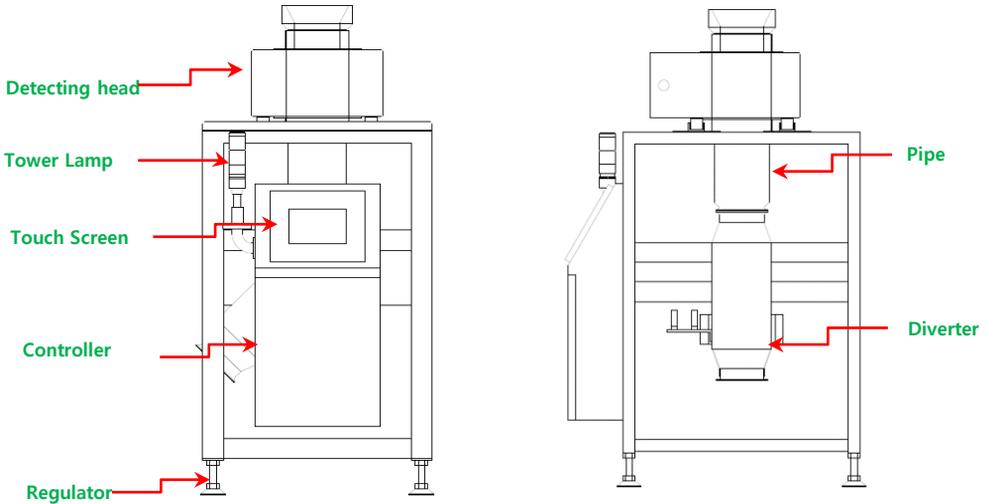
Category	Description	Category	Description
<b>Detector head</b>	Consists of inner coil and circuit, etc.. that processes electronic signal.	<b>Conveyor drive-switch</b>	Switch to drive or stop the conveyor or drive.
<b>Touch screen</b>	Displays manipulation of the menu and detection status in the metal detector through the 7-inch touch screen.	<b>Power switch</b>	Metal Detector Power On/Off Switch.
<b>Guide</b>	Prevents deviation of the product during the conveyor drive.	<b>Tunnel</b>	Tunnels that the product for inspection passes through.
<b>Tower lamp</b>	Displays the state of metal detector by lighting of the lamp is lit. Green / Red.	<b>Belt</b>	As part of conveying products, the cleanliness must always be maintained to have the performance of metal detector as desired.
<b>Motor / Reducer</b>	Power-generating unit of the conveyor.	<b>Regulator</b>	Fixation of the conveyor and adjustment of the height <i>(Note) If you do not rigidly fix using an adjuster during installing a metal detector, it may be the cause of the malfunction.</i>
<b>Power boxes</b>	Connections between power supply of metal detector head and an external device.		

## Structure and name of each parts for pharmaceutical type



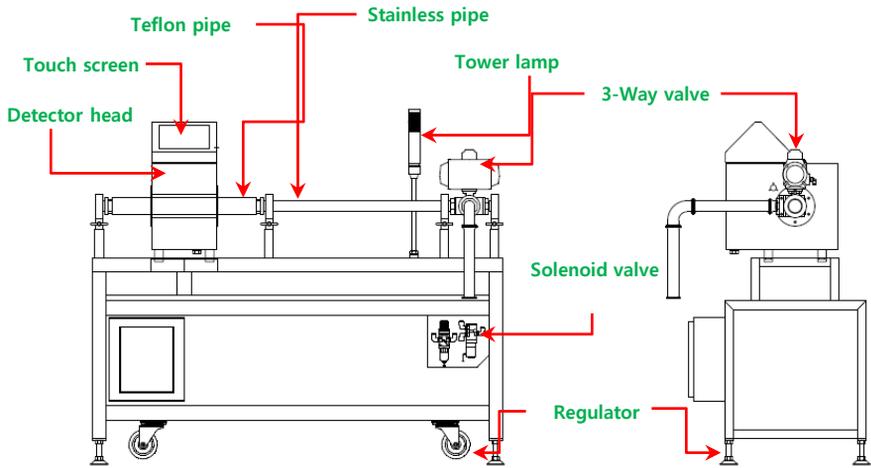
Category	Description	Category	Description
<b>Detector head</b>	Consists of inner coil and circuit, etc. that processes electronic signal.	<b>Height-adjustable steering wheel</b>	The handle to adjust the height of the top and bottom of the head.
<b>Touch screen</b>	Displays manipulation of the menu and detection status in the metal detector through the 7-inch touch screen.	<b>Power switch</b>	Metal detection circuitry, power supply, input and output on-board handling.
<b>Tower lamp</b>	Displays the state of metal detector by lighting of the lamp is lit. Green / Red	<b>Angle-adjustable steering wheel</b>	The handle to adjust the angle of the head.
<b>Rejecter</b>	Good/Bad product switch solenoid driving unit.		

## Structure and name of each parts for fall type



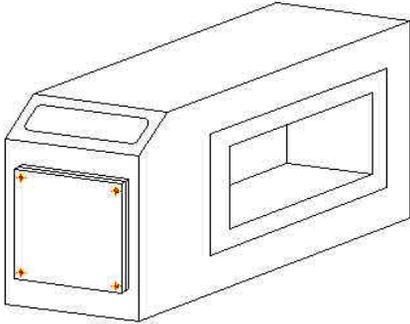
Category	Description	Category	Description
<b>Detecting head</b>	Consists of inner coil and circuit, etc. that processes electronic signal.	<b>Pipe</b>	Product passes into this pipe. When product pass metal detector, the machine detect metal and send signal to rejection system.
<b>Touch Screen</b>	Displays manipulation of the menu and detection status in the metal detector through the 7-inch touch screen.	<b>Controller</b>	Metal detection circuitry, power supply, input and output on-board housing.
<b>Tower lamp</b>	Displays the state of metal detector by lighting of the lamp is lit. Green / Red.	<b>Regulator</b>	Fixation of the frame and adjustment of the height (Note) If you do not rigidly fix using an adjuster during installing a metal detector, it may be the cause of the malfunction.
<b>Diverter</b>	Good/Bad product switch solenoid driving unit.		

## Structure and name of each parts for pie types

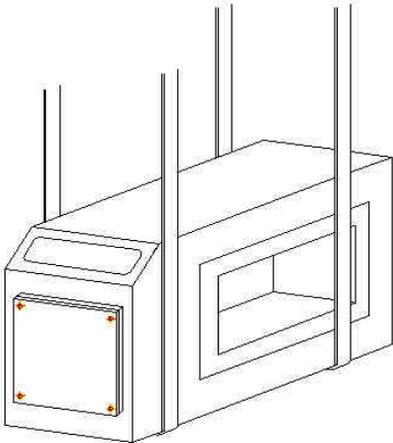
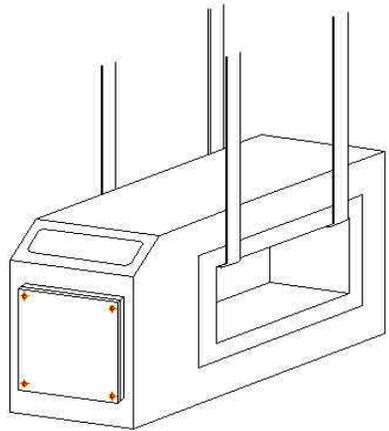


Category	Description	Category	Description
<b>Detector head</b>	Consists of inner coil and circuit, etc.. that processes electronic signal	<b>Teflon pipe</b>	It protects the product not to contact directly from the detector head.
<b>Touch screen</b>	Displays manipulation of the menu and detection status in the metal detector through the 7-inch touch screen.	<b>Stainless pipe</b>	The product passes through this pipe.
<b>Tower lamp</b>	Displays the state of metal detector by lighting of the lamp is lit. Green / Red	<b>Solenoid valve</b>	It controls 3-Way valve working direction.
<b>3-Way valve</b>	It has one inlet and two outlets and controls the direction of outlet depending on good or bad product	<b>Regulator</b>	Fixation of the conveyor and adjustment of the height (Note) If you do not rigidly fix using a n adjuster during installing a metal d etector, it may be the cause of the m alfunction.

## 1. Transportation of equipment



Never put a hand or other tools inside the tunnel during the transportation of the device. It may cause a malfunction of the device.

**O****X**

## 2. Installation of the metal detector

**Metal detector malfunctions by being sensitive to impact, external electromagnetic wave and magnetic field. Thus, only if a metal detector is installed in the following ways, the performance of a device can be achieved to the maximum.**

- 1) All rollers must be isolated from the roller by insulating one end of the roller from conveyor frame.
- 2) The bearing block must be isolated from the frame.
- 3) All the bolts that fix a metal detector to the frame must be insulated with a plastic cup washer.
- 4) The conveyor belt must be the one for a metal detector, and bonding method and bonding materials must be used carefully.
- 5) The wires or metallic attachments around the metal detector should be kept away from the metal detector.
- 6) In particular, signal lines for inverter should be isolated by a separate pipe duct.
- 7) A separate conveyor for the metal detector should be made and used.

## 3. Place of Installation

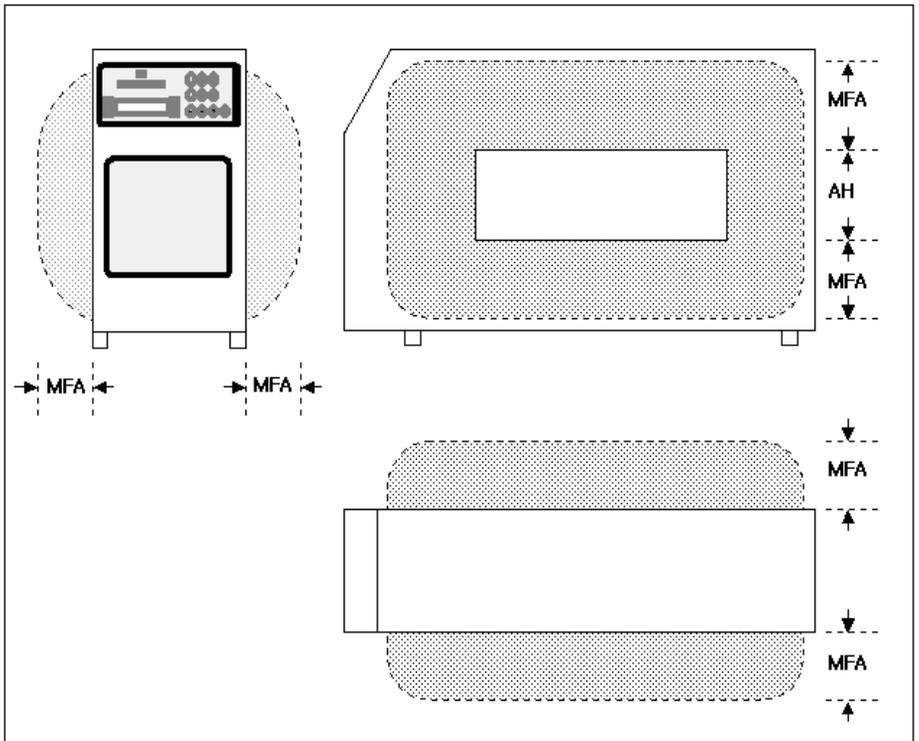
- 1) Do not place large metal objects around this product.
- 2) Connect the power to where voltage fluctuation is low.  
(Power ground should be used)
- 3) Avoid equipment with excessive external vibration and vibration.
- 4) Avoid equipment that generates strong electrostatic.
- 5) Install it far away from the motor or servo motor..
- 6) Do not place it near devices that use powerful electricity.
- 7) Install it in a place with a constant ambient temperature and no humidity.
- 8) Install it away from the devices that leak electromagnetic wave and magnetic field excessively.
- 9) In particular, install it away from where the inverter motor is used.

## 4. KEEP METAL FREE AREA (MFA)

**[What is Metal Free Area?]**

If a metal exists in the vicinity of the tunnel where the electromagnetic field is formed due to the electromagnetic nature of the metal detector to measure the change of the microscopic state of the electromagnetic field, the metal detection reactions appear.

In order to prevent malfunction of the metal detector, a metal should not be positioned in the vicinity of the tunnel area of the metal detector, which is called Metal Free Area.



MFA : Metal Free Area, AH : Aperture Height

Low Frequency 50 KHz – 200 KHz

: MFA = AH

High Frequency 400 KHz

: MFA = AH x 1.8

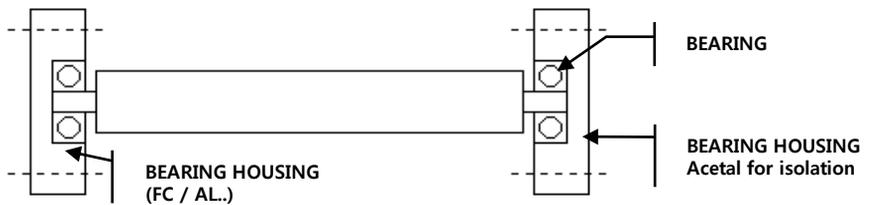
\*\*\* Do not place any metal objects in M.F.A.

## 5. Conveyor isolation and the belt for metal detector

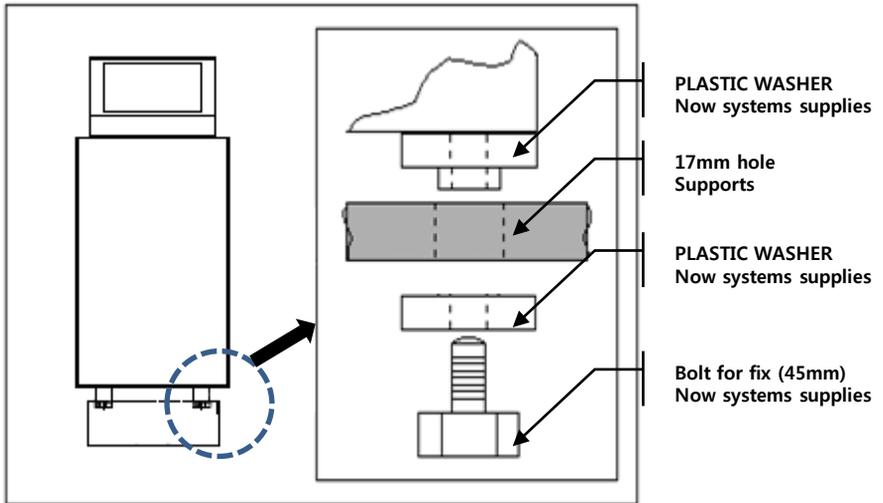
### [Reasons for requiring isolation]

A metal detector is the equipment that measures subtle changes of the signal, and the instantaneous ground-state changes that occur while rotating, affect the circuit of the metal detector.

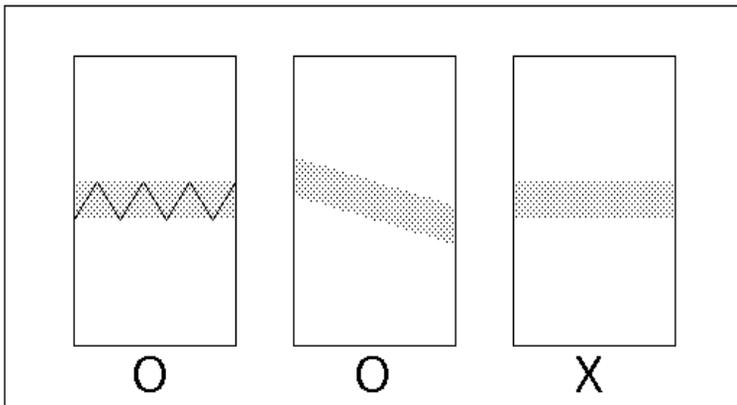
In order to block T instantaneous change of the ground state that occur while roller or bearing is rotating, the one end should be insulated.



< ROLLER Isolation >



< Metal detector isolation when installed >



Metal components should not be contained in the bonding materials used for belt splicing.

Please contact us or your dealer to replace the belt for the metal detector only.

\*\*\* When mounting CONVEYOR BELT, please install it not to touch the tunnel side of the metal detector.

### Precautions for Installation

Considerations during the initial  
installation

- Avoid installing it around the inverter for motor control.
  - The radiation noise generated during the operation of the inverter will result in the malfunction of the metal detector. If unavoidable, separate the output line of an inverter by a metal duct and ground the duct.
- Avoid installing where severe vibration is expected.
  - Severe vibration and shock can cause the destruction of the magnetic insulation or malfunction.
- Do not connect the power supply in severe voltage fluctuating.
  - Severe voltage fluctuations can cause the noise of the input power.
  - If unavoidable, install a noise filter.
- Avoid where sudden temperature changes are expected or other places with direct sunlight.
  - The rapid changes in temperature do a devastating effect on the molding inside the metal detector.
- No wires or metallic attachments should be placed around the metal detector head.
  - A certain range of MFA exists around the metal detector head. Any metal structures and metal attachments in the MFA can be the cause of the malfunction.
- The conveyor should not be in contact with enclosures around the conveyor.
  - It can destruct magnetic insulation and cause a malfunction.

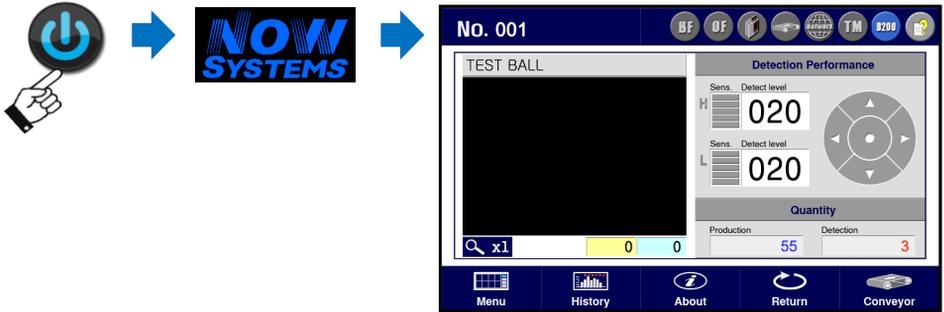
### Precautions for Management

Precautions after installation

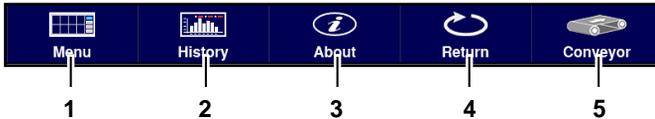
- The conveyor belt should always be kept clean.
  - If foreign matter is attached to the conveyor belt, the metal detector detects this product as a checkpoint, which causes a malfunction.
- Protects against strong acid or salt.
  - Strong acid or salt affects the durability of enclosures.
- During the operation of LCD screen, do not use sharp tools (nail, knife).
  - The protective film is damaged to affect the performance of the waterproof.
- Do not pull the power cord excessively.
  - Internal connection may be cut.

It is the main screen where Detection, Screening & etc.. are executed.

- ▶ Please press the power switch on the side of the display box.



#### Menu Area



#### 1. "Menu" button

You can go to sub menus that can change the values necessary for the operation of the metal detector, including product setting, screening, detection history, preferences and etc., You need to input the password to enter the menu, and some functions are limited to functions depending on the security level of the password.

#### 2. "History" button

You can view various kinds of detecting history.

#### 3. "About" button

You can check the device number, version information, frequency setting and etc.,

#### 4. "Return" button

You can stop the operation of warning lamp and buzzer when metal is detected. But, the operation of warning lamp and buzzer may automatically stop after a certain period of time even without need to press return button depending on set parameters of the metal detector.

#### 5. "Conveyor" button

You can operate or stop the conveyor. If you want to start conveyor operation, please touch it until the conveyor starts to move. (You also can use the conveyor operation switch on the side of the display box to start or stop the operation of the conveyor.)

#### 5-1. Screen lock button (Only for Pharmaceutical model)

If push this button, all menus on the screen are locked, touch function is not activated.

## Status Display Area



## ICONS

ICONS	IMAGES
Balance Fault	
Output Fault	
Sensor	
Conveyor	
LAN	
Test Mode	
Frequency	
Help	

**1. Product Number**

It means the number of product in production. You can directly access the menu to change the product by touching the area of product number.

**2. (BF) "Balance Fault" Icon**

It shows the status of the balance inside the tunnel. If it is in error, its icon becomes red. If this error persists, please put in for a A/S.

**3. (OF) "Output Fault" Icon**

It shows the status of the output of the signal for the detection. If it is in error, its icon becomes red. If this error persists, please put in for an A/S.

**4. "Sensor" Icon**

This icon is activated when the product in production is detected through the sensor. And, if the product is detected by sensor, the Quantity for production will increase.  
(If you choose "Bulk" in Product/Set Parameter, production quantity will not be digitized.)

**5. "Conveyor" Icon**

If the conveyor is in operation, its icon is activated.

**6. "LAN Connection" Icon**

When the machine is connected to management program through the network, its icon is activated.

**7. "Test Mode" Icon**

Under the test mode, even if the metal is detected, rejecting operation such as conveyor stop or other types of rejecters will not work. Switching between normal and test mode will be made if you touch and hold the test mode icon for more than a second.

(Unless otherwise you have a specific reason, please do not set it to the test mode because rejecting operation will not be made even if the metal is detected.)

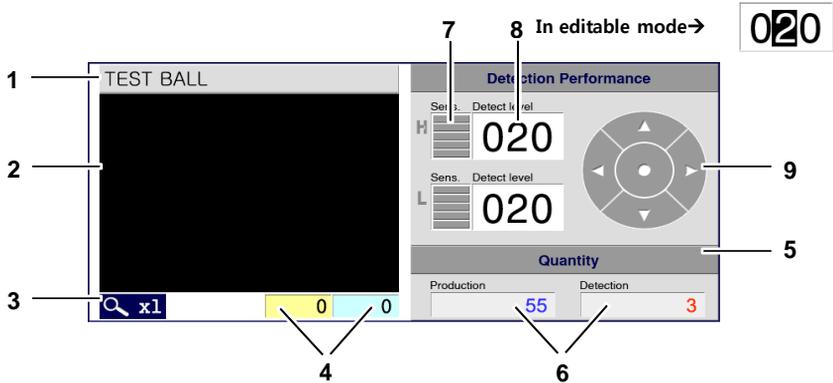
**8. "Frequency" Icon**

It shows mode and frequency of detecting signal for the current product in production.

**9. "Help" Icon**

If you touch this icon, you can view Help message in the current screen.

## Main Area

**1. Product Name**

It shows the name of the product in production.

**2. Waveform Graph Screen**

You can see detection signal in waveform graph on this screen.

**3. Magnify Icon**

You can adjust magnification of the detection signal in waveform graph screen at the rate of (x1, x2, x4).

**4. Display the peak values of the detection signal in integer value**

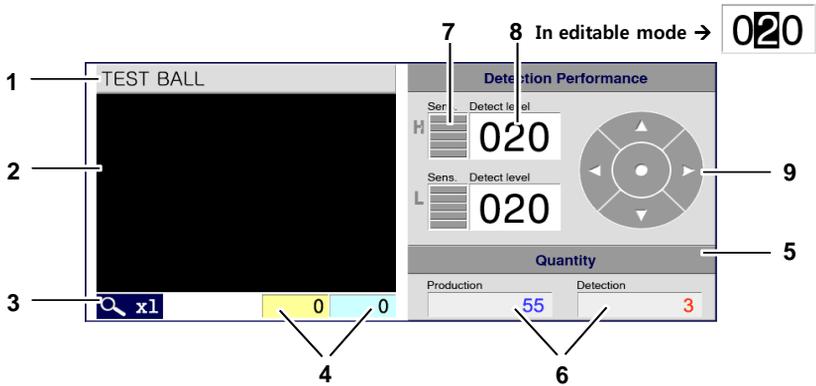
Simultaneously, it shows the peak values of the detection signal on H (High) & L (Low) channels in integer value.

**5. Quantity Deletion Icon**

If you touch this icon, you can turn the quantity of production and detection each to 0.  
(Even if you clear both the quantities to 0, detection history will not be initialized.)

**6. Display Quantity of Production & Detection**

It shows quantity of products that are checked through the sensor and number of detection.



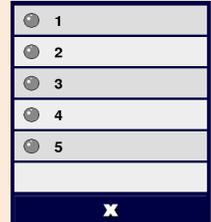
#### 7. Sensitivity Display / How to set

It shows the level of sensitivity set to the current product as a bar graph. There is also a case that channel (L) is inactive under the modes (D1 & D2) using a single-frequency signal only, depending on the setting of the frequency.

Its setting ranges from 1 (minimum) to 5 (maximum).

#### [How to set sensitivity]

- 1) Please touch the area of sensitivity to change on the pop-up screen.
- 2) Then, it will return to the main screen after saving its change.  
If you want to close the window without changing it, please touch X under the pop-up screen.



#### 8. Detection Level Display / How to set

It shows detection level set to the current product. If the measured detecting value exceeds the detection level, the metal detection is made. There is also a case that channel (L) is inactive under the modes (D1 & D2) using single-frequency signal only, depending on the setting of the frequency.

If you want to modify the detection level of the corresponding channel, please touch the area on which the value is displayed. Its setting ranges from 0 (most sensitive) to 100 (most insensitive). If you touch it, the corresponding area will be switched to the editable mode.

#### 9. Sensitivity Adjustment Icon.

- 1) Left / Right Icon: You can move the number of digits in the channel to change.
- 2) Up / Down Icon: You can increase or decrease the value of the corresponding digits by 1.
- 3) Central (Deactivation) Icon: You can deactivate the editable mode of the channel that is currently selected. (If you touch the activated area again, it will be the same.)

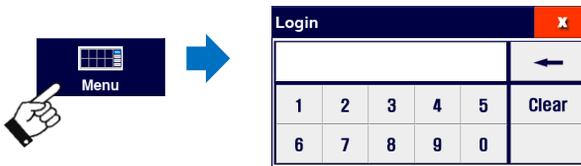
#### ◆ Tip ...

- ◆ On the pharmaceutical model, it shows the phase on no.9 area instead of sensitivity and level.

## Log-in

You need to go through log-in process to input password in order to change the setting state of the metal detector. There are both administrator and engineer authority depending on the password to enter. Unlike the log-in of engineer authority, there are restrictions on some of the settings to change in the log-in of administrator authority.

► Please touch "Menu" icon on the main screen.



1) Please enter the 5-digit password.

- **Administrator Authority**

: The password is "20000".

Some of the sub-menus can only be modified with the engineer authority.

- **Engineer Authority**

: The password is "30119".

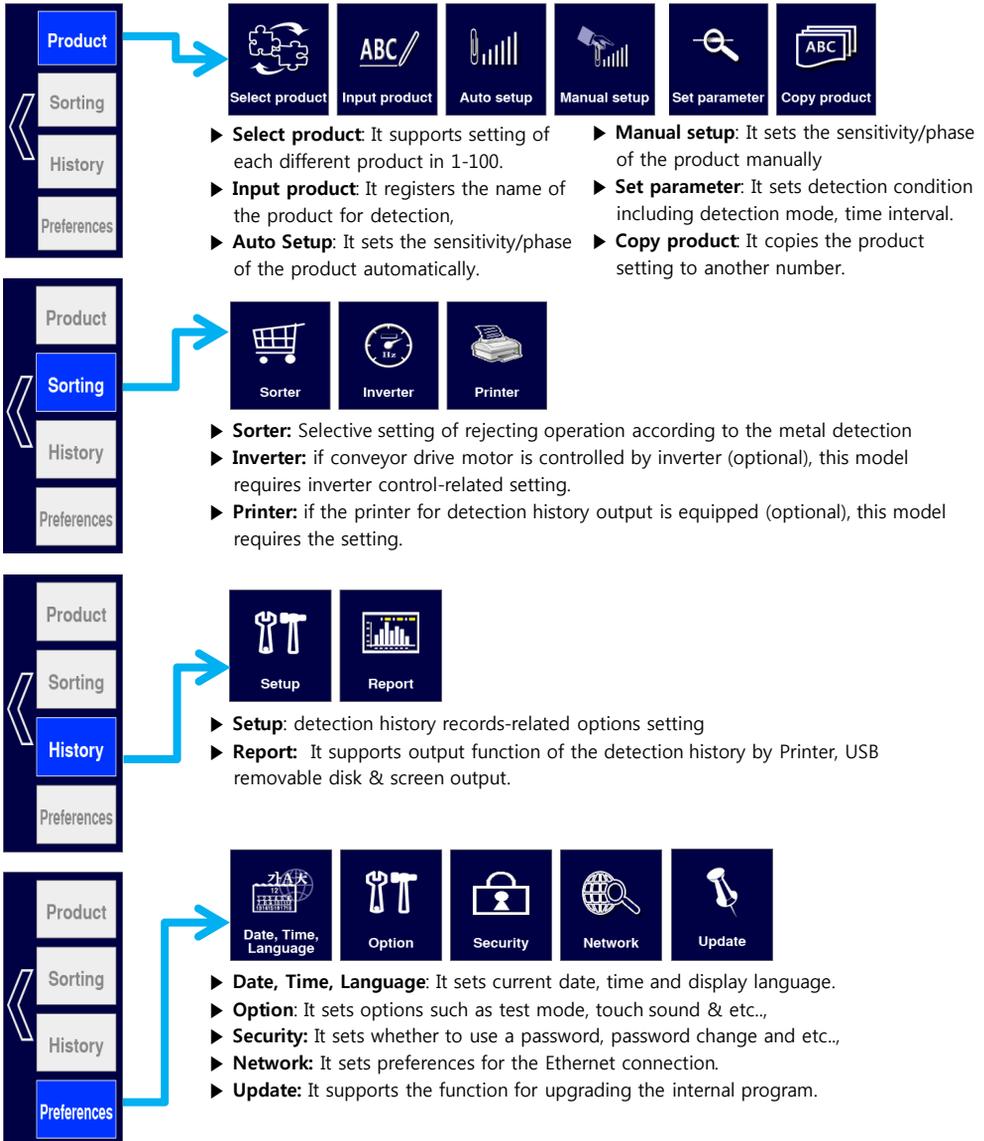
### ◆ Tip ...

◆ If you forget the password, please contact the manufacturer for how to log in.

## Menu Structure

There are various kinds of menus including detection performance-related setting, rejecting function setting, detection history management, preferences and etc.,

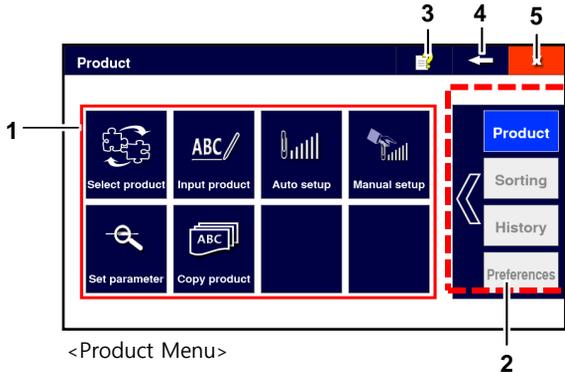
The entire menu structure is as follows:



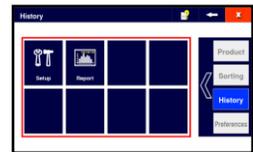
## Configuration of Menu Screen

: There are main menus of "Product", "Sorting", "History" & "Preferences".  
Configuration of each menu by screen area is as follows.

▶ After logging-in, you can choose various main and sub menus on the screen.



<Sorting Menu>



<History Menu>



<Preferences Menu>

### 1. Sub-Menu Icon

There are various sub-menus on each main menu.

### 2. Move to Main-Menu

You can move to various main-menus like Product, Sorting, History, Preferences & etc.,

### 3. Help Icon

If you touch this icon, you will see help message on the screen.

### 4. Previous Menu Icon

If you touch this icon, you can go back to the previous menu but work in progress for some menu or input screen will not be saved.

### 5. Exit

If you touch this icon, you will move to the main screen and work in progress for some menu or input screen will not be saved.

It is the process on how to set up operational status of a metal detector for an inspecting product. In general, you can set up each product as the following order.

## Order of Set-up metal detector for each product



You can set up registration number of the product to be selected. You can set up from 1 to 100. If you select the number where product setting data are already stored, the previous data will be erased.



You can register the name of the product. If you do not need to enter the name of the product, you can skip this process.



Detecting mode, phase and sensitivity of the product are set up automatically. If you already know the values of phase and sensitivity in advance, you may skip this step and input the corresponding values in manual setup directly. (This auto setup may not be available in some cases according to the specifications of the installation.)



Detecting mode, phase and sensitivity of the product are set up manually. If you already get enough detection sensitivity with the value set by auto setup, you may skip this process. In general, you can use this manual set up for fine-tuning both phase and sensitivity of the product after auto setup.



You can set various values associated with passing method, detection speed and & detect interval and etc.,



You can set how rejecting action is made after metal is detected.

## Product Change



1) After selecting the product number in the product list, please touch the icon to change. After applying the selected product, please return to the previous screen.

2) When you register a new product, please touch the number at free. If you touch the number which has already been registered, the previous information will be changed to the value as set newly.

3) You can use this function when you are to change the product to test as a product that is already registered.

4) When you need to erase already registered product, you can do so by touching "DEL" icon after selecting the item number that you want to delete.



## How to use shortcuts

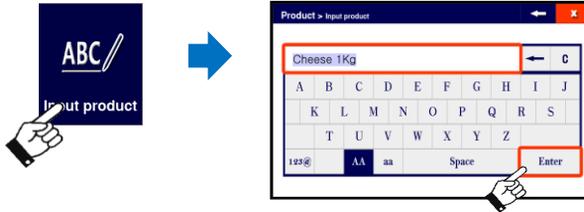


► If you touch **Main screen > Product number**, you can go directly to the screen of Product Change.

## ◆ Tip ...

- ◆ If you touch the product number on the main screen, you can go to the screen for Product Change
- ◆ If you touch the same number as the currently chosen product, it will be ignored.

**Input product** : It is the function to register the name of a product.



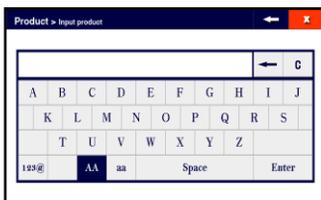
▶ Please touch the icon of **Product> Input product**.

Please input the name of a product, and then touch 'Enter'.  
The product name entered is saved and returns to the previous screen.

You can change the keyboard for the input of English uppercase letter/lowercase letter/numbers and special characters.



<Keyboard for numbers and special characters>



<English uppercase letter keyboard>

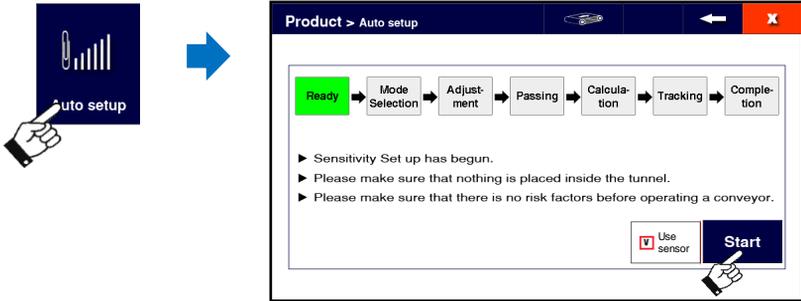


<English lowercase letter keyboard>

## ◆ Tip ...

- ◆ Up to 20 letters of English/numbers and 20 letters of special characters can be set.

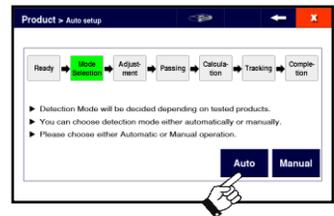
**Auto setup** : Test frequency, phase and sensitivity of the product can be set automatically.



▶ Please touch the icon of **Product > Auto setup**.

1) Please touch "Start" to start Auto setup.

\*\* If you want to use the sensor, please touch "Use sensor".



2) As a next step, please choose detecting mode by touching either **Auto** or **Manual**.  
If you already know phase of the product in advance, you can use manual setup mode.

For the process of manual setup, Please refer to **manual setup of Mode Selection** at page 28.

3) Afterward, please follow the instructions on the screen. Depending on the properties of a product that passes, the passing numbers are progressed up to 3 to 12 times.

The higher properties (high salinity/water) of a product are , the more passing time will be required.

### ◆ Tip ...

- ◆ If you already know phase of the product in advance, you can use manual setup mode.
  - Please refer to **manual setup of Mode Selection**.
- ◆ After Auto setup is completed, you can switch to the screen of Input product.
  - please refer to **Input Product after completion of Auto setup**.

## 4) Auto setup of mode selection

Auto setup of detection can be used only for the following four modes.

Detection mode	Test signal frequency	Properties of a product to test
Dry product 1	Middle level frequency	Small amounts of water-containing or completely frozen products.
Dry product 2	High level frequency	Products with no moisture and salinity
Moisture-containing product 1	Low and Middle frequency combined	Products containing large amounts of water and salinity
Moisture-containing product 2	Low and High frequency combined	Products containing small amounts of water and salinity

Out of the above four detection modes, performance of detection gets higher in the following sequence.

**Dry product 2 > Dry product 1 > Moisture-containing product 2 > Moisture-containing product 1**

If you could not reach desired sensitivity in the detection mode found through auto setup, you should select the detection mode manually by referring to the order of higher detection performance as shown in the above examples and then continue to proceed auto setup.

## 5) Special detection mode

Following four kinds of special detection modes can not be chosen by auto set up.

Detection mode	Test signal frequency	Product type for checking
Aluminum deposition	Low level frequency	Metal detection in a product with aluminum-deposited packaging material
Moisture-containing product 3	Low and Middle-mixed low signal output	Products that contain very large amounts of water and salt
Moisture-containing product 4	Low and High-mixed low signal output	Products that contain very large amounts of water and salt
Check metal missing part	Low level frequency	Detects missing aluminum-deposited packaging materials such as deoxidizer, desiccant, etc..

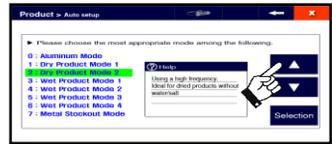
If you need to use the above 4 detection modes, you need to proceed to the next step after selecting the relevant mode manually in the process of setting detection mode.

When you are not able to make proper setting sensitivity and phase under the modes of Moisture-containing product 1 & 2, you can give a try to modes of Moisture-containing 3 & 4.

In case of the food, a large amount of cheese products and pickles corresponds to this case and be applied to a large amount of cheese products, a large amount of pickled products, etc..

**Manual setup of the detecting mode:** You can proceed auto setup process swiftly by setting up detecting mode manually.

- 1) Please move to the desired mode by using of (Up Down) icon.
- 2) If you touch the chosen mode, you can move to the next stage after saving the change.



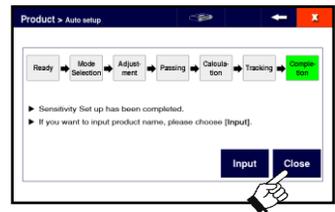
Detection Mode	Help
Aluminum deposition	Low-frequency signal to be used Suitable for products containing small amount of metal components such as aluminum-deposited packaging products.
Dry Product 1	Mid-frequency signal to be used Suitable for a small amount of water / salt containing-product
Dry Product 2	A high-frequency signal to be used Suitable for a water and salt-free dry product
Moisture-Containing Product 1	Low/mid-frequency mixed-signal to be used Suitable for a product with high-water/salinity
Moisture-Containing Product 2	Low/high-frequency mixed-signal to be used Suitable for a product with low-water/salinity
Moisture-Containing product 3	Low/mid-frequency mixed-signal to be used Suitable for mass products with high-water/salinity
Moisture-Containing Product 4	Low/high-frequency mixed-signal to be used Suitable for mass products with high-water/salinity
Check missing metal part	Screens a product with no metal part

The highest sensitivity mode without water/salinity

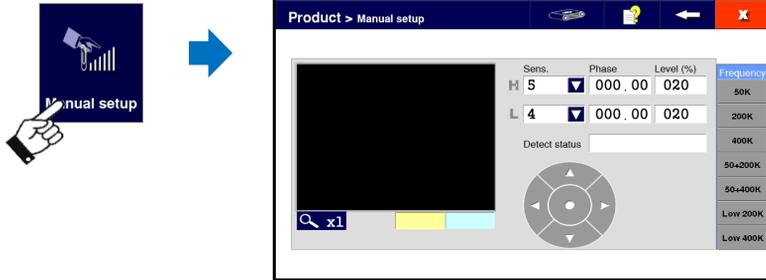
The highest sensitivity mode with water/salinity

## Input name of the product after auto setup process

If you touch 'Input', you can go to the screen for 'Input Product'. If you have already input the product or want to do it later, please touch 'Close' button.



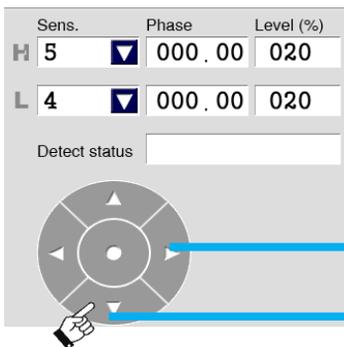
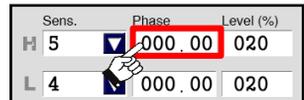
**Manual setup:** if you already know how to make fine-tuning, product phase and sensitivity after making auto setup, please proceed with this manual setup. Even in case of a particular product of which auto setup cannot be performed, please proceed with this manual setup.



## Set up Phase

- 1) Please touch phase input window
- 2) If the cursor appears on the input window, please change the value using the arrow key.

Please set up the value where the graph becomes the smallest by passing the product and observing the graph. In case of dual-frequency mode, please set it by observing 'H' for the yellow graph and 'L' for the green graph.



Right/ Left : Shift Change



Up/ Down button: Value Change



### ◆ Tip ...

#### ◆ Product Phase?

The value set to remove impact of the testing product. The more accurate this value, the smaller metal can be detected. You can set it as a value between 0 and 180.00. It is the best situation that there is no product impact so that no signal is detected on the graph even if the product is passed through.

**Set up Phase**

If testing frequency is at dual frequency mode, the Phase setting area of the "L" side (bottom area) will be activated. In this case, please set up the value where the curve of green graph becomes the smallest by passing the product through and observing the graph.

	Sens.	Phase	Level (%)
H	5	000.00	020
L	4	000.00	020

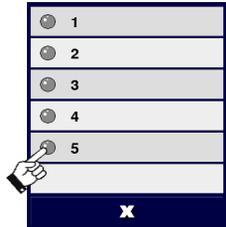
**Set up Sensitivity**

If you choose the sensitivity to change, it will be returned to the manual setting screen after being saved. If you intend to close the window without saving it, please touch X. "1" is the minimum sensitivity and "5" is the maximum sensitivity.

Please make adjustments while reducing the sensitivity not to make the maximum value of the graph exceed 50% of the screen by passing the product through and observing the graphs of the detection.

If testing frequency is at dual frequency mode, the Phase setting area of the "L" side (bottom area) will be activated. In this case, please set up the value where the curve of green graph becomes the smallest by passing the product through and observing the graph.

	Sens.	Phase	Level (%)
H	5	000.00	020
L	4	000.00	020

**Detection Level**

Please adjust detection level appearing as a horizontal line on the graph. If the detected value exceeds the detection level, it can be determined as metal detection.

In case of dual-frequency mode, two detection levels in yellow and green color each are displayed, and yellow color uses setting area of 'H' and green color uses setting area of 'L' as shown in the right figure.

	Sens.	Phase	Level (%)
H	5	000.00	020
L	4	000.00	020

**◆ Tip ...****◆ What is dual-frequency mode?**

Unlike a typical metal detector, NMD-530 Series metal detector uses various kinds of frequency modes selectively. Out of these modes, dual-frequency mode mixes two different frequency signals to achieve the optimal detecting performance in ferrous and stainless steel for inspecting products with high properties.

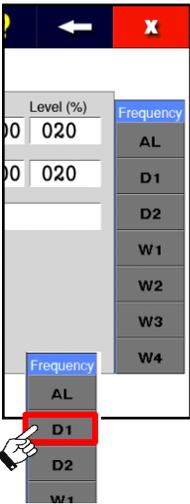
**◆ Tip ...****◆ What is the appropriate value set to detection level?**

Please set the detection level higher than the graph shown while passing testing products through. If, due to the deviation between testing products, the height of the graph is not constant, please set it to be 2 to 3 times higher than the height of the graph, and if it is constant, please set it to be approximately 1.5 times higher. If you set the detection level close to the peak of the graph, the sensitivity gets higher, but if there is a deviation between products, the rate of malfunction will increase..

## Setup Inspection-frequency

You can directly select the frequency to be used for inspection.

Depending on the properties (water/salinity-containing level, freezing condition, temperature & etc..) of a testing product, you can select the optimal inspection frequency.



Frequency	Detection Mode	Help
AL	Aluminum deposition	Low-frequency signal to be used Suitable for products containing small amount of metal components such as aluminum-deposited packaging products
D1	Dry Product 1	Mid-frequency signal to be used Suitable for a small amount of water/salt containing product
D2	Dry Product 2	High-frequency signal to be used Suitable for a water and salt-free dry product
W1	Moisture-Containing Products 1	Low/mid-frequency mixed signal to be used Suitable for a product with high-water/salinity
W2	Moisture-Containing Products 2	Low/high-frequency mixed-signal to be used Suitable for a product with low-water/salinity
W3	Moisture-Containing Products 3	Low/mid-frequency mixed-signal to be used Suitable for mass products with high-water/salinity
W4	Moisture-Containing Products 4	Low/high-frequency mixed-signal to be used Suitable for mass products with high-water/salinity

Touch the relevant area

The highest sensitivity mode with water/salinity

The highest sensitivity mode without Water/salinity

### ◆ Tip ...

#### ◆ Selection of Inspection Frequency

If automatic setting is performed, inspection frequency mode is automatically selected to the most appropriate mode. However, depending on the condition of the testing products, there could be a mode available with better sensitivity than one detected automatically. But you can change it through the manual set up.

In general, if a product contains almost no water, you will get the best detecting performance from D2 mode and if a product contains much water and salinity, you will get the best detecting performance from W2 mode.

If you cannot set in either D2 or W2 mode (too large properties, etc..), please try changing the mode in the following order adjusting phase, sensitivity and detection level to search for the mode to get the best detection sensitivity.

**Dry products: D2 -> D1**

**Non-dry products: W2 -> W1 -> W4 -> W3**

## Settings of Detection Conditions and Sorting Time

: You can set each individual detecting conditions according to products



Product > Set parameter				
Method <input checked="" type="radio"/> Single <input type="radio"/> Bulk <input type="radio"/> Metal	Detection Speed <input type="radio"/> Low <input checked="" type="radio"/> Mid <input type="radio"/> High	Delay time	Operating Time	Passing time
		0.50	0.50	0.50
		Threshold	Detect Interval	
		10	0.50	

- ▶ Please touch the area of **Product>Detection Conditions**.

1) Please select **product passing method** to meet a product that you want to detect.

If there is space between products that are passing through, please select **Single**.

If there is no space between products that are passing through, please select **Bulk**.

And if you need to detect a product with no metallic parts such as deoxidizer, please select **Metal**.

If you choose **Bulk** as product passing method, you cannot count product quantity.

Method
<input checked="" type="radio"/> Single
<input type="radio"/> Bulk
<input type="radio"/> Metal

2) Please select **Detection Speed**

If a metal detector is a normal conveyor type, please choose **Low**.

If a metal detector is a fall type, please choose **Mild**.

And, If there is a special case requiring maximum detection speed, please select **High**. However, if you select High, the ambient noise removal software stops working internally so that the noise effects may be increased.

Detection Speed
<input type="radio"/> Low
<input checked="" type="radio"/> Mid
<input type="radio"/> High

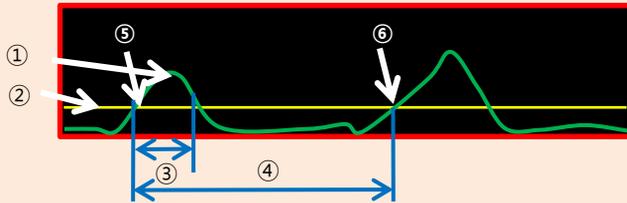
Delay time	Operating Time	Passing time
0.50	0.50	0.50
Threshold	Detect Interval	
10	0.50	

3) These are parameters required for sorting.  
You can set **Delay time/Operating time/Passing time, threshold/detect interval**, etc.. additionally.

For the meaning of each parameter, see refer to the next page of this manual book.

4) It makes the fake detection signal for rejecting test.

D-SIG



[Glossary]

If a metal detection graph was drawn in the form of the above graph,

- ① Metal Detection Value
- ② Detection Level-Setting Value
- ③ Detection Level-Exceeding Retention Time
- ④ Detect Interval
- ⑤ Detection Level-Exceeding Time Point 1
- ⑥ Detection Level-Exceeding Time Point 2

Each setting item has the following meanings:

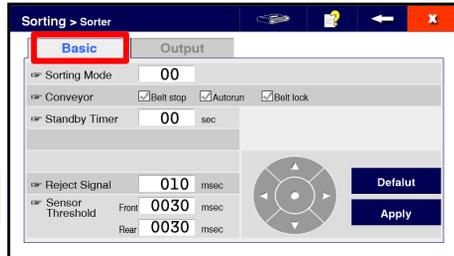
- ▶ **Delay time:** The time on whether to operate the rejecter after taking some time at the time of ⑤ when the detection signal ① exceeds the detection level (since the time of metal detection made).  
(The setting of rejecter is made in sorting management menu/sorter setting).  
For example, if the rejecter is set to stop the conveyor, and the delay time is 1 second, the metal detecting is done and the conveyor stops after 1 second.
- ▶ **Operating time:** The time set to run the rejecter for a certain time. For example, if the rejecter is set to the solenoid in the sorter setting, delay time is set to 1 second and operating time is set to 2 seconds, the metal detection will be made and after the delay for 1 second (delay time), the solenoid for rejecter will be running for only 2 seconds. (operating time).
- ▶ **Passing time:** The time set to be taken for the testing products to pass through the photo sensor installed at the entrance of the detection tunnel and completely out of the tunnel.  
This is only the value available when "Metal" (product passing method) was chosen.  
If product passing method is set to either Single or Bulk, this setting is not used.
- ▶ **Threshold:** It is the time set on if how much time exceeds at the time ⑤ when metal detection signal exceeds the detection level in the above figure, it should be admitted as a metal detection, and the unit is msec (1/1000 seconds). For example, if Threshold is set at 100 and detecting signal exceeds the detection level for 99msec, it is not recognized as a metal detection. This function is usually used in the environment with lots of pulse noise and it is set to a value of less than 20. **Unless otherwise you have a special reason, please keep it as basic value set at Ex-factory.**
- ▶ **Detect Interval:** It is time setting on how long next metal detection is set to ignore from the time of metal detecting. When a metal is detected in the position ⑤ of the above figure and then the signal exceeding the detection level is also input in the position ⑥, and if the time difference ⑤ and ⑥ is 1 second, and the value set to continuous detection is 2 seconds, the signal of ⑥ will not be accepted as a metal detection.

This function should be used only if operating time of the sorter is long or there are time constraints to recover its original position of the rejecter.

**Basic Setting of the sorter** : You can set the parameters required for sorting metal-detected products.



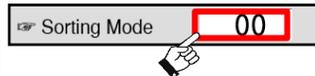
▶ Please touch the tab on **Sorting Mode>Sorter Setting > Basic Setting**



### Sorting Mode

1) Please touch the input window and set the sorting mode. Basic sorting mode is 00, and in some cases, it may be delivered at the factory after being set to a different mode according to the specifications of the purchaser.

Normally, factory default value will be used.



### Belt Stop

2) If you touch the area of the belt stop, you can switch between tick and not-tick. If this function is checked, the conveyor will stop when metal is detected.

This function is not available for a pharmaceutical model.



### Auto-Run

3) If you touch the area of auto-run, you can switch between tick and not-tick. If the function is checked, the conveyor will start automatically when the unit's power is turned on.

Normally, factory default value will be used.

This function is not available for a pharmaceutical model.



### Belt lock

4) If you touch the area of the belt lock, you can switch between tick and not-tick. If the function is checked, the conveyor is running only when the unit's power is turned on.

Normally, factory default value will be used.

This function is not available for a pharmaceutical model.



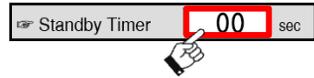
**Standby Timer**

5) When driving the conveyor, the machine will ignore metal detection signal for an amount of time set here.

Immediately after starting to transfer heavy-duty products, high vibration products, etc., you can use this function when trying to ignore metal detection operation for a period of time.

Normally, factory default value will be used.

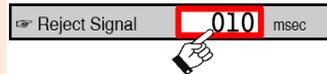
This function is not available for a pharmaceutical model.

**Reject Signal**

6) You can adjust the length of the reject signal. The detection signal is output as long as the time set here from when the metal is detected. It is used when the signal of a certain length of time needs to be received from the device operating after receiving the signals of a metal detector such as PLC, Inverter and etc.,

Normally, factory default value will be used.

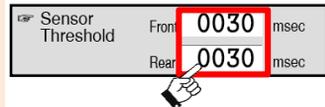
This function is not available for a pharmaceutical model.

**Sensor Threshold**

7) You can adjust the rate of sensitivity of photo sensor for the product detection. The general case to use these values by changing them is when you need to remove unstable recognition time of packaging materials by setting entry/transfer time to Front/Rear because the sensor recognition is not accurate at entry of photoelectric sensor due to transparency or translucency of the product's packing material.

Normally, factory default value will be used.

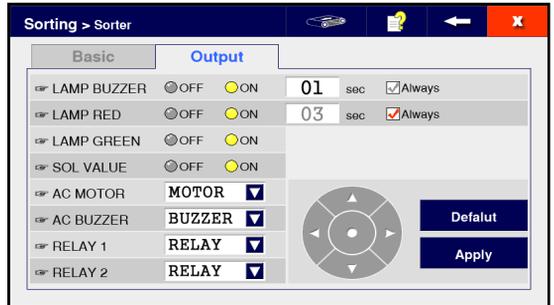
This function is not available for a pharmaceutical model.



**Output port setting of sorter** : You can set output parameters required for sorting metal-detected products.



▶ Please touch the area of **Sorting Management > Sorter Setting > Output Port Setting**.



### LAMP BUZZER

1) You can set whether to use the buzzer of tower lamp and the operating time. The buzzer will ring as long as time is set. If you check 'ON', the buzzer continues to ring until you touch the 'Return' button on the main screen.



### LAMP RED

2) You can set whether to use the red light of tower lamp and operating time. The lamp is lit as long as time is set. If you check 'ON', the lamp continues to be turned on until you touch the 'Return' button on the main screen.



### LAMP GREEN

3) You can set whether to use the green light of tower lamp. If you check 'ON', the green lamp is lit when the power of a metal detector is turned on.



### SOL VALUE

4) If you want to output the solenoid driving signal during the metal detection, please check 'ON'. The driving time will work on as long as working time is set in 'Setting of Detection Conditions'



**OUTPUT PORT ( AC MOTOR, AC BUZZER, RELAY 1,2 )**

5) You can synchronize each control signal and port. You can limit (OFF) the output signal of AC MOTOR, AC BUZZER, RELAY 1 and RELAY 2 port, or can synchronize with the signal of each SMPS, MOTOR, BUZZER, etc..

**For example, if you synchronize RELAY1 with BUZZER,**

RELAY1 will be ON while BUZZER sounds due to metal detection, and if BUZZER stops, RELAY1 will be OFF.

Taking advantage of this function, you can use it for the purpose of interlocking metal detector with other machines, or adding a separate sorter that a user will add.

☞ AC MOTOR	MOTOR	▼
☞ AC BUZZER	BUZZER	▼
☞ RELAY 1	RELAY	▼
☞ RELAY 2	RELAY	▼

◆ **Tip ...**

◆ **SMPS, MOTOR, BUZZER, RELAY, REJECT to be interlocked?**

SMPS means the main power supply of a metal detector.

(You can select this when interlocking with the metal On/Off.)

MOTOR means conveyor drive motor.

(You can Select this when interlocking with the conveyor motor.)

BUZZER means the buzzer built-in the tower lamp.

RELAY runs when metal detector is operating and release with reset button..

REJECT runs when metal detector is operating and it is released when the operation time elapses.

**Copy product** : You can copy and use the setting value of an existing product.



- ▶ Please touch **Product > Copy product**.



- 1) Please select the product number from the product list, and then touch **Copy**.



- 2) Please select the product number for copy from the product list, and then touch **Paste**.

- 3) When the copy is complete, the product name copied will be selected.



#### ◆ Tip ...

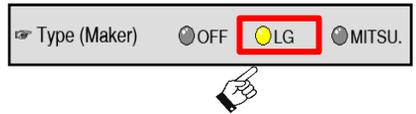
- ◆ The information on quantity (production, detection) cannot be copied.
- ◆ When you set a product that has similar setting of sensitivity and phase with the product that has already been set, it would be convenient to use this function if you copy the setting state, and then fine-tune the sensitivity and phase by manual setting.

**Inverter Setting** : You can start, stop and control the speed through the serial communication with the inverter. (It is limited to inverter equipped model)

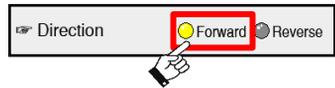


▶ Please touch **Sorting> Inverter**.

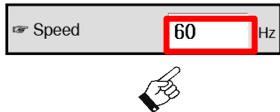
1) Please press one of the OFF/LG/MITSU (\*TBD) icon. If it is a model with no inverter, please set it to OFF.



2) Please select the direction of the conveyor..



3) Please touch the area of Inverter Speed to bring up its input window.



4) Please enter the inverter speed in the input window of inverter speed, and then select OK.

The input range is from 0 to 60 Hz. Typically 0 means Stop and 60 is the highest speed.



**Tip ...**

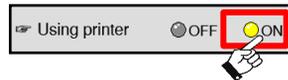
- ◆ The model of an inverter that is supported can be added/changed, depending on the supply and demand situation on parts of the manufacturer.

**Printer setting** : You can control the required data in using the printer. (Only for the models with a printer)



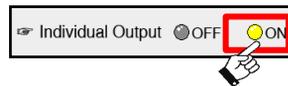
► Please touch **Sorting > Printer**.

1) Please touch **ON** for using the printer.

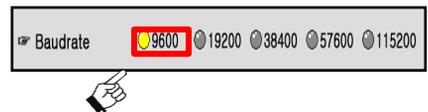


2) If you touch **ON** for Individual Output, you can print out its date, its product number and etc., for every metal detection.

You can use this function only if Using printer is on.



3) Set the communication speed. Only if printer use is in ON, this can be changed.



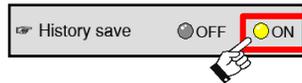
**Detection history Setup:** You can perform whether to save the detection history and the initialization of the history.



▶ Please touch **History> Setup**.

### History save

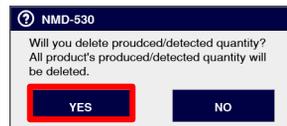
1) Detection history is saved only if History save is set to **ON**. The default value is **ON**.



### Deleting quantity for production / detection

- 1) Please touch **Reset**.
- 2) If you touch **YES** on the right pop-up window on the bottom asking if you want to delete data or not, all products' production/detection quantity will be deleted.

If you touch **No**, deleting process will be canceled.



### Initialize All

- 1) Please touch **Reset**.
- 2) If you touch **YES** on the pop-up window on the bottom asking if you want to delete data, all detection history will be deleted.

If you touch **No**, deleting process will be canceled.



**Checking detection history:** You can check detection history by designating period.



► Please touch **History> Report**



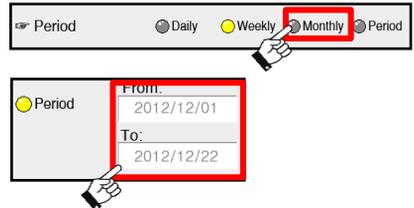
1) Please touch one of devices.  
(LCD / USB / Printer)

LCD : Data is on the screen.  
USB : Data is saved to USB Disk.  
Printer : Data is printed out by printer.



2) Please touch one of viewing periods.  
(daily/weekly/monthly/period)

If you choose period, you can designate viewing period like the right picture on the bottom.



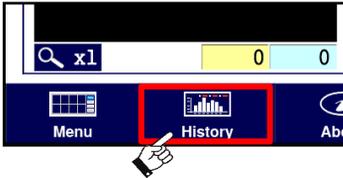
3) Please touch **Output**.

Right picture is the example of output from LCD screen.

- Please touch    
You can check detection data of before / after.
- Please touch    
When detection data exceed 10,  
you can check detection data for 10 cases of before/after.

Checking Period	DATE: 12/01/08	NG : 2	
12/01/01 - 12/01/02	CODE	PROJ	TIME
0003	80	1	10:01:59
0004	80	1	10:10:22
0005	80	1	10:10:22
0006	80	1	10:10:22
0007	80	1	10:10:22
0008	80	1	10:10:22
0009	80	1	10:10:22
0010	80	1	10:10:22
0011	80	1	10:10:22
0012	80	1	10:10:22
0013	80	1	10:10:22
0014	80	1	10:10:22
0015	80	1	10:10:22
0016	80	1	10:10:22
0017	80	1	10:10:22
0018	80	1	10:10:22
0019	80	1	10:10:22
0020	80	1	10:10:22
0021	80	1	10:10:22
0022	80	1	10:10:22
0023	80	1	10:10:22
0024	80	1	10:10:22
0025	80	1	10:10:22
0026	80	1	10:10:22
0027	80	1	10:10:22
0028	80	1	10:10:22
0029	80	1	10:10:22
0030	80	1	10:10:22
0031	80	1	10:10:22
0032	80	1	10:10:22
0033	80	1	10:10:22
0034	80	1	10:10:22
0035	80	1	10:10:22
0036	80	1	10:10:22
0037	80	1	10:10:22
0038	80	1	10:10:22
0039	80	1	10:10:22
0040	80	1	10:10:22
0041	80	1	10:10:22
0042	80	1	10:10:22
0043	80	1	10:10:22
0044	80	1	10:10:22
0045	80	1	10:10:22
0046	80	1	10:10:22
0047	80	1	10:10:22
0048	80	1	10:10:22
0049	80	1	10:10:22
0050	80	1	10:10:22
0051	80	1	10:10:22
0052	80	1	10:10:22
0053	80	1	10:10:22
0054	80	1	10:10:22
0055	80	1	10:10:22
0056	80	1	10:10:22
0057	80	1	10:10:22
0058	80	1	10:10:22
0059	80	1	10:10:22
0060	80	1	10:10:22
0061	80	1	10:10:22
0062	80	1	10:10:22
0063	80	1	10:10:22
0064	80	1	10:10:22
0065	80	1	10:10:22
0066	80	1	10:10:22
0067	80	1	10:10:22
0068	80	1	10:10:22
0069	80	1	10:10:22
0070	80	1	10:10:22
0071	80	1	10:10:22
0072	80	1	10:10:22
0073	80	1	10:10:22
0074	80	1	10:10:22
0075	80	1	10:10:22
0076	80	1	10:10:22
0077	80	1	10:10:22
0078	80	1	10:10:22
0079	80	1	10:10:22
0080	80	1	10:10:22
0081	80	1	10:10:22
0082	80	1	10:10:22
0083	80	1	10:10:22
0084	80	1	10:10:22
0085	80	1	10:10:22
0086	80	1	10:10:22
0087	80	1	10:10:22
0088	80	1	10:10:22
0089	80	1	10:10:22
0090	80	1	10:10:22
0091	80	1	10:10:22
0092	80	1	10:10:22
0093	80	1	10:10:22
0094	80	1	10:10:22
0095	80	1	10:10:22
0096	80	1	10:10:22
0097	80	1	10:10:22
0098	80	1	10:10:22
0099	80	1	10:10:22
0100	80	1	10:10:22
0101	80	1	10:10:22
0102	80	1	10:10:22
0103	80	1	10:10:22
0104	80	1	10:10:22
0105	80	1	10:10:22
0106	80	1	10:10:22
0107	80	1	10:10:22
0108	80	1	10:10:22
0109	80	1	10:10:22
0110	80	1	10:10:22
0111	80	1	10:10:22
0112	80	1	10:10:22
0113	80	1	10:10:22
0114	80	1	10:10:22
0115	80	1	10:10:22
0116	80	1	10:10:22
0117	80	1	10:10:22
0118	80	1	10:10:22
0119	80	1	10:10:22
0120	80	1	10:10:22
0121	80	1	10:10:22
0122	80	1	10:10:22
0123	80	1	10:10:22
0124	80	1	10:10:22
0125	80	1	10:10:22
0126	80	1	10:10:22
0127	80	1	10:10:22
0128	80	1	10:10:22
0129	80	1	10:10:22
0130	80	1	10:10:22
0131	80	1	10:10:22
0132	80	1	10:10:22
0133	80	1	10:10:22
0134	80	1	10:10:22
0135	80	1	10:10:22
0136	80	1	10:10:22
0137	80	1	10:10:22
0138	80	1	10:10:22
0139	80	1	10:10:22
0140	80	1	10:10:22
0141	80	1	10:10:22
0142	80	1	10:10:22
0143	80	1	10:10:22
0144	80	1	10:10:22
0145	80	1	10:10:22
0146	80	1	10:10:22
0147	80	1	10:10:22
0148	80	1	10:10:22
0149	80	1	10:10:22
0150	80	1	10:10:22
0151	80	1	10:10:22
0152	80	1	10:10:22
0153	80	1	10:10:22
0154	80	1	10:10:22
0155	80	1	10:10:22
0156	80	1	10:10:22
0157	80	1	10:10:22
0158	80	1	10:10:22
0159	80	1	10:10:22
0160	80	1	10:10:22
0161	80	1	10:10:22
0162	80	1	10:10:22
0163	80	1	10:10:22
0164	80	1	10:10:22
0165	80	1	10:10:22
0166	80	1	10:10:22
0167	80	1	10:10:22
0168	80	1	10:10:22
0169	80	1	10:10:22
0170	80	1	10:10:22
0171	80	1	10:10:22
0172	80	1	10:10:22
0173	80	1	10:10:22
0174	80	1	10:10:22
0175	80	1	10:10:22
0176	80	1	10:10:22
0177	80	1	10:10:22
0178	80	1	10:10:22
0179	80	1	10:10:22
0180	80	1	10:10:22
0181	80	1	10:10:22
0182	80	1	10:10:22
0183	80	1	10:10:22
0184	80	1	10:10:22
0185	80	1	10:10:22
0186	80	1	10:10:22
0187	80	1	10:10:22
0188	80	1	10:10:22
0189	80	1	10:10:22
0190	80	1	10:10:22
0191	80	1	10:10:22
0192	80	1	10:10:22
0193	80	1	10:10:22
0194	80	1	10:10:22
0195	80	1	10:10:22
0196	80	1	10:10:22
0197	80	1	10:10:22
0198	80	1	10:10:22
0199	80	1	10:10:22
0200	80	1	10:10:22
0201	80	1	10:10:22
0202	80	1	10:10:22
0203	80	1	10:10:22
0204	80	1	10:10:22
0205	80	1	10:10:22
0206	80	1	10:10:22
0207	80	1	10:10:22
0208	80	1	10:10:22
0209	80	1	10:10:22
0210	80	1	10:10:22
0211	80	1	10:10:22
0212	80	1	10:10:22
0213	80	1	10:10:22
0214	80	1	10:10:22
0215	80	1	10:10:22
0216	80	1	10:10:22
0217	80	1	10:10:22
0218	80	1	10:10:22
0219	80	1	10:10:22
0220	80	1	10:10:22
0221	80	1	10:10:22
0222	80	1	10:10:22
0223	80	1	10:10:22
0224	80	1	10:10:22
0225	80	1	10:10:22
0226	80	1	10:10:22
0227	80	1	10:10:22
0228	80	1	10:10:22
0229	80	1	10:10:22
0230	80	1	10:10:22
0231	80	1	10:10:22
0232	80	1	10:10:22
0233	80	1	10:10:22
0234	80	1	10:10:22
0235	80	1	10:10:22
0236	80	1	10:10:22
0237	80	1	10:10:22
0238	80	1	10:10:22
0239	80	1	10:10:22
0240	80	1	10:10:22
0241	80	1	10:10:22
0242	80	1	10:10:22
0243	80	1	10:10:22
0244	80	1	10:10:22
0245	80	1	10:10:

### Using the shortcut key for detection history



- ▶ If you touch **History** on the main screen, you can go to the detecting history screen

#### ◆ Tip ...

- ◆ **Daily:** Total data from today at 00:00 to present time
- ◆ **Weekly:** Total data from this Monday at 00:00 to present time
- ◆ **Monthly:** Total data from the first day of this month at 00:00 to present time
- ◆ **Period:** Total data for a certain period from ~ to~, total date is within 1 year
- ◆ **In order to use this function, current date and time should be input.**  
You can check current data and time on the top of the main screen.

**Registering date and time:** You can register date and time of system



Preferences > Date, Time, Language

Date	12/01/22
Time	10:35:59
Language	English

- ▶ Please touch  
**Preferences> Date, Time, Language.**

### Date

- 1) Please touch the area of date.
- 2) Please input today's date on the right pop-up **System data** window on the bottom.

If you finish inputting all 6 digits, the newly changed data will be applied and it goes back to the previous screen automatically.

Date 12/01/22

System date

12 / 01 / 22						←
1	2	3	4	5	Clear	
6	7	8	9	0	◀	▶

### Time

- 1) Please touch the area of time.
- 2) Please input present time on the right pop-up **System time** window on the bottom.

If you finish inputting all 6 digits, the newly changed time will be applied and it goes back to the previous screen automatically.

Time 10:35:59

System time

10 : 35 : 59						←
1	2	3	4	5	Clear	
6	7	8	9	0	◀	▶

### ◆ Tip ...

- ◆ **in case of changing System date, detection history should be initialized. System date is criteria of detecting history data management so that changing it will result in errors in data**

**Language setting:** You can set the language on the machine by country.



▶ Please touch **Preferences> Date, Time, Language.**

1) Please touch the language display area.



2) If you select the language to change, it will be saved and then be returned to the previous menu.

Since then, the language changed will be applied.

If you want to close the pop-up window without any change, touch X.

Supported languages are 7 kinds including languages including Korean, English, Chinese, Japanese, Spanish, Vietnamese, Turkish.



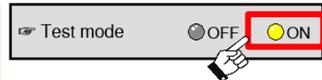
◆ **Tip ...**

- ◆ Other foreign language can be added through additional work upon request of customers.

**Test Mode Setting:** You can set Test Mode on and off.



▶ Please Touch **Preferences> Option**.



- 1) Please touch the area of **ON** in the test mode to set it on.
- 2) Please touch the area of **OFF** in the test mode to set it off.

### Using the Shortcut Key

▶ Please touch and hold **test mode icon** on the top of the **main screen** to activate and deactivate **test mode**.



#### ◆ Tip ...

- ◆ When test mode is on, metal detecting operation is still on but rejecting operation is on hold. (Sorting Operation: Conveyor Stop, Tower Lamp, Rejecter Operation, External Signal Output and etc..)

**Setting of Menu Expiration Time:** When setting time elapses, menu screen will return to the main screen.

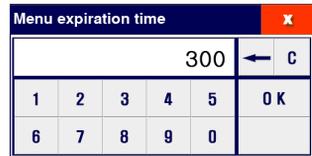


► Please touch  
**Preferences> Option.**



1) Please touch the display area of **Menu expiration time** on the right-up screen.

2) If you input **Menu expiration time** and touch **OK** on the right-down screen, it saves setup parameters and return to the prior screen.



◆ **Tip ...**

- ◆ **Menu Expiration Time is not applied to some of menus (auto setup, manual setup).**

**Touch correction:** You can reset the touch coordinates of the LCD screen.



► Please touch the area of **Preferences> Option**

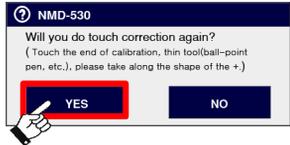


1) Please touch screen setting.



2) Please touch **YES**.

If you want to cancel it, please touch **NO**.

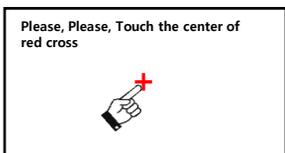
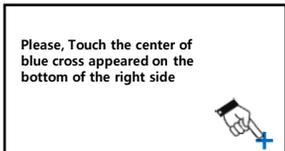
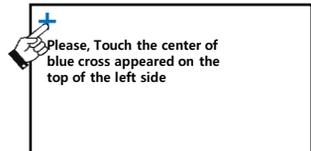


3) Please touch along “+ shape” by using of the thin end (such as ball point pen and etc.,)

It should be done as the below order.

- Upper-Left corner
- Lower-Right corner
- Right Center

When this work is done, it saves correction value and returns to the main screen.



**If touch calibration is not in a normal condition, machine operation might be impossible.**

**The machine is shipped after touch correction is made so that please do not change it unless otherwise there is a special case.**

**Effect Tone Setup:** You can set whether or not to use effect tone.



▶ Please touch **Preferences> Option**.

### Notice Sound

If you tick **Notice**, it beeps sound in the case of power on, work completion and etc.,



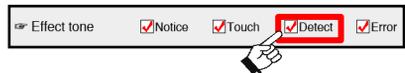
### Touch Sound

If you tick **Touch**, it beeps sound when the button of LCD screen is pressed.



### Detect Sound

If you tick Detect, it beeps sound when a metal is detected.



### Error Sound

If you tick Error, it beeps sound in various situation of errors.



**Security Setting:** You can set whether or not to use passwords or change current password.



► Please touch preferences > Security.

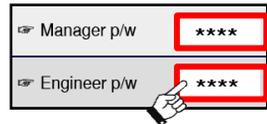
### Using Password

You can set whether or not to use the password.  
If you touch **ON**, you are required to login for entering the menu.



### Administrator Password, Engineer Password

1) Please select which password you will change.



2) Please enter new password in the right pop-up window.

Once 5 digits of new password is entered, it will be saved and return to the prior screen.

The changed password is valid from the next menu entry.



#### ◆ Tip ...

◆ If Using password is set to OFF, use of some of the menu is limited.

**Shortcut Restriction:** You can limit using shortcut key on the main screen.



► Please touch  
**Preferences> Security.**



### Product Change Shortcut Key

If you tick **Product**, you can go to product change menu directly by touching a product number on the top of the main screen.



### Test Mode Shortcut Key

If you tick **Test**, you can change between **Test Mode** and Normal mode by pressing Test Mode icon on the top of the main screen.



### Sensitivity Setting Shortcuts

If you tick **Sens.**, sensitivity and detection level can be modified on the main screen.



### Quantity Initialization Shortcuts

If you tick **Q'ty**, production and detection quantity can be initialized on the main screen.



**Network** : You can set up Ethernet connection environment.

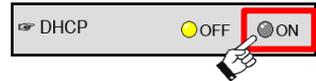


▶ Please touch **Preferences> Security**.

Preferences > network	
DHCP	OFF ON
Port number	8000
IP Address	192.168.000.005
Subnet mask	255.255.255.000
Gateway	192.168.000.001

1) If the network supports IP Auto-setup function, IP setting to be assigned automatically is enabled.

You need to ask the network administrator for the appropriate IP setting value.



2) Select the Port setting window.

Enter a value in the pop-up window, and then if you touch OK, the setup parameters are saved to return to the previous screen.



Port					
8000					← C
1	2	3	4	5	OK
6	7	8	9	0	

3) Select IP Address, Subnet Mask and gateway in order.

Enter a value in each pop-up window. When you finish inputting 12-digit value, save the value and return the previous screen.

If **Import IP address automatically** is ON, input of the rest items except for ports will be limited.

IP Address					
192.168.000.005					←
1	2	3	4	5	Clear
6	7	8	9	0	◀ ▶

## Backup and recovery of data

:You can backup and restore all setting values for the machines and all registered products.



► Please touch  
**Preferences> Update.**

### Data Backup

1) Please decide the storage location, and then touch **Backup**.



- If you tick Inner memory, the data will be backup into the inner memory.
- If you do not tick Inner memory, the data will be backup into USB disk. In this case, please insert the USB disk first before data backup. (Serial number of the machine.DAT files) will be generated in the USB disk.

Ex) If serial number of the machine is 12345678, its file name will be "12345678.DAT".

### Data Restoration

1) Please designate where data will be read from and then touch **Restore**.



- If you check Inner memory, the data will be imported from the internal memory.
- If you do not tick Inner memory, the data will be read from the USB Disk. In this case, please insert the USB Disk first before the data restoration. (Serial number of the machine.DAT files) must exist in the root of the USB Disk.

Ex) If serial number of the machine is 12345678, its file name will be "12345678.DAT"

2) Please touch **YES**.

Once restoration is completed, please reboot the power.

If you want to cancel restoration, please touch **NO**.



**Firmware Upgrade:** You can upgrade/downgrade the internal program.



► Please touch **Preferences> Update**.

1) Please touch the board that you want to upgrade.

If you want to go back to the old version or stay the same version, please tick **Downgrade**.



2) If you touch **YES**, a pop-up window that displays its progress will be displayed as the right-bottom pop-up window.

If you just want to cancel upgrade, please touch **No**.



3) Old and new version of firmware and upgrade process are displayed.

Once upgrade is completed, the machine will reboot automatically.



◆ **Tip ...**

- ◆ **During the upgrade, please do not turn off the power and disconnect the USB disk.**
- ◆ Before the upgrade, please insert the USB Disk.
- ◆ The relevant firmware must be in the root directory of the USB Disk.  
Please make sure if the below files exist on the USB Disk before the work.
  - DISPLAY : NMD530DP.FWD
  - MAIN : NMD530CP.FWD
  - REJECT : NMD530RP.FWD

**FPGA upgrade:** You can upgrade the internal program.



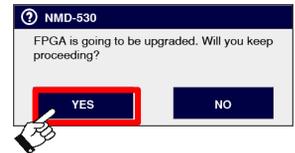
▶ Please touch **Preferences > Update**.

1) Please touch **FPGA**.



2) If you touch **YES**, a pop-up window that displays the progress will be displayed.

If you just want to cancel it, please touch **NO**.



3) The progress is displayed.

Once upgrade is completed, the machine will reboot automatically.



#### ◆ Tip ...

- ◆ **During the upgrade, please do not turn the power off and disconnect the USB Disk.**
- ◆ Before the upgrade, please insert the USB Disk.
- ◆ The relevant firmware must be in the root directory of the USB Disk. Please make sure if N530FPGA.FWD file exists before the upgrade.

## Symptoms

## Check List

Nothing is on the screen.

Please check if the power cord is correctly connected and try turning on the power by pressing the power switch on the side of the head

Metal cannot be detected.

In case of a metal smaller than test piece used when setting the machine, it may not be detected.

Please check whether to detect it by using of test piece provided when installing the machine.

Conveyor does not stop even when metal is detected.

When a machine is on a test mode, the conveyor does not stop or rejecters do not operate even if a metal is detected. If a test mode icon at the top of the main screen is blue, it is on a test mode.

Test Mode:



There is nothing inside the tunnel but Metal detection is operated when the Conveyor operates.

If there is any contaminating foreign material on the conveyor belt, these symptoms might occur.

Even if there is no metal while products are passing through the tunnel, a metal is Detected.

Please make sure if the phase and sensitivity are correctly set for the product to test. The exact phase and sensitivity setting for each product should be made, using the auto setup and manual setup function in order to prevent the product itself from being detected as metal.

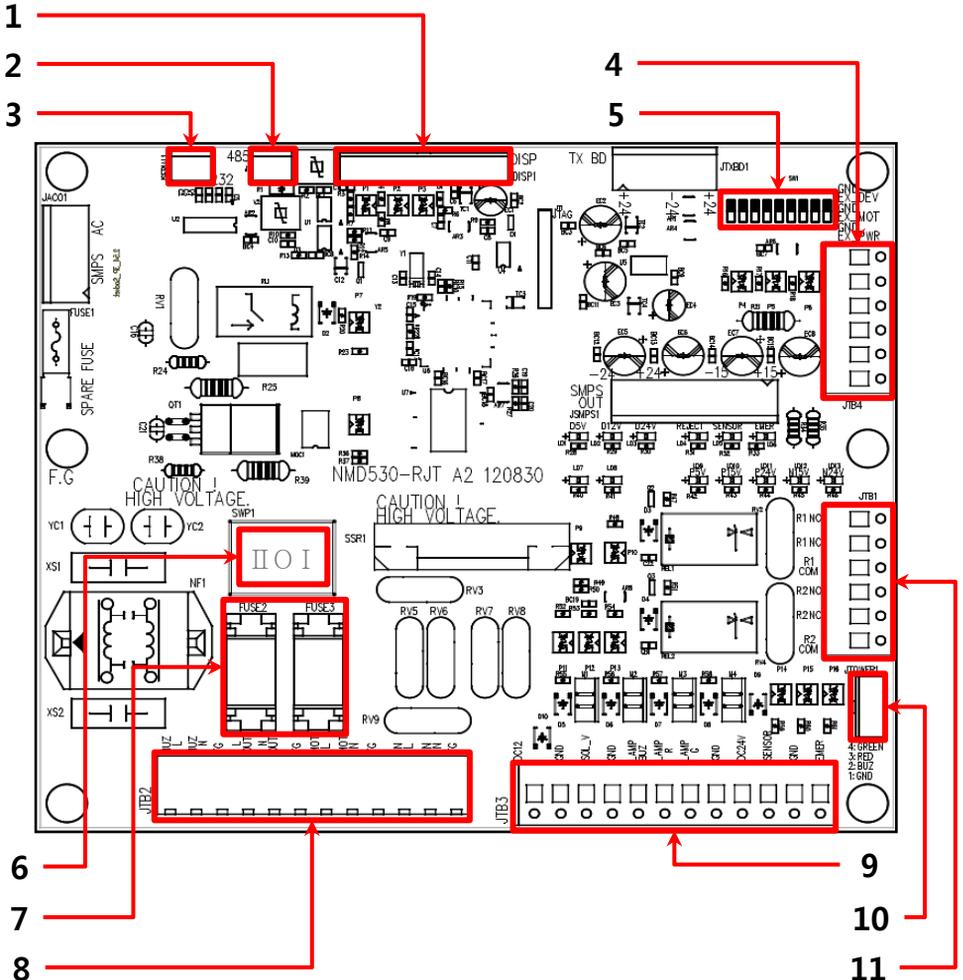
Even if there is not a product for test on the tunnel, a metal is detected

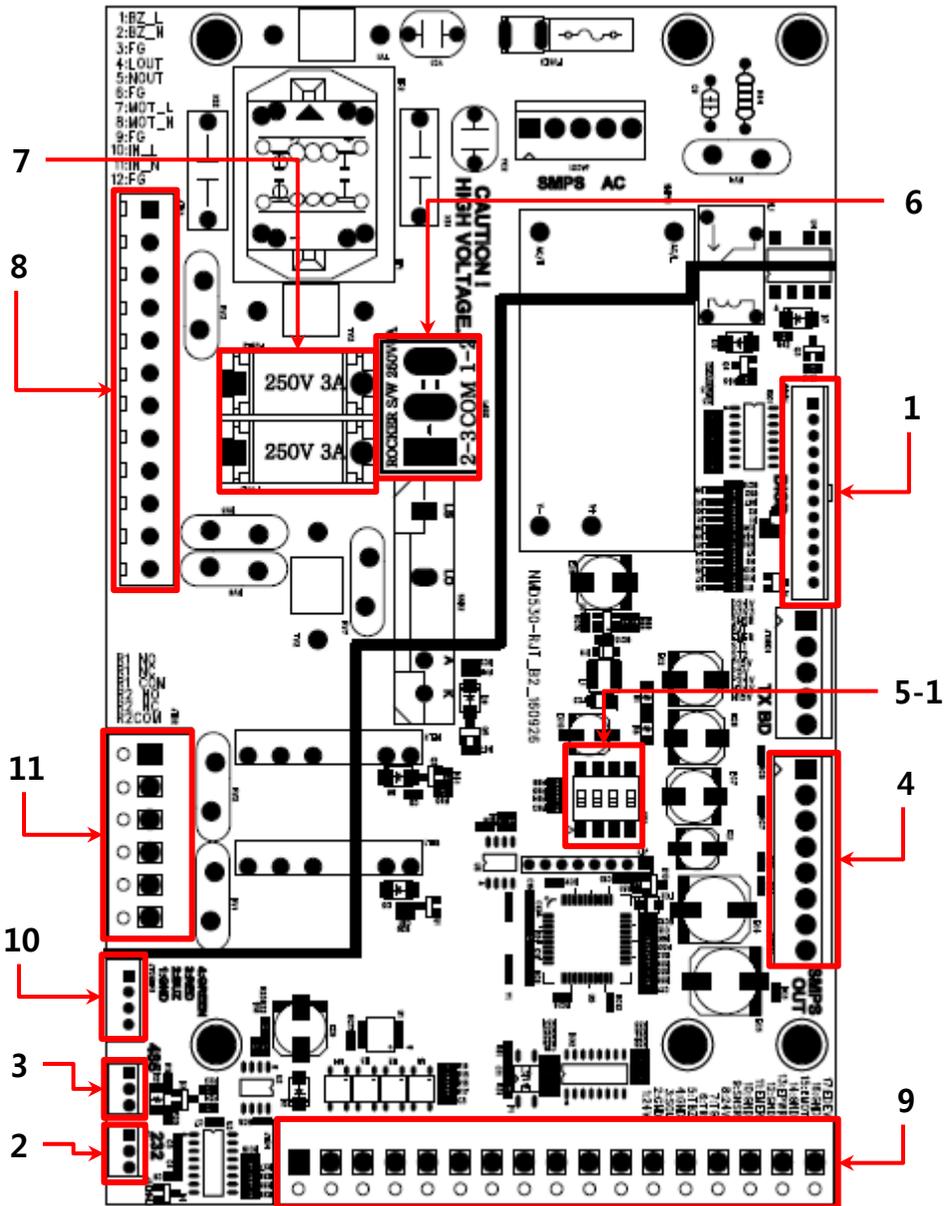
Please make sure if there is anything changed in surrounding environment from the time when installing. Especially, if there is any change in electromagnetic sources such as inverters, high-capacity motors, high-voltage power lines, abrupt changes in ambient temperature or environmental change to large metal structures around a metal detector, please try removing them and operating the machine again.

If you remove the cover of the power supply box, power supply circuit that supplies power to the metal detector head appears. In the power supply circuit, a terminal block that can process a signal in conjunction with other equipment in addition to the power supply is installed, so you can use it by connecting for each purpose.



Please work it for the safety after disconnecting power input line.





< Board Revision: B2 >

### 1. Head Input and Output

1	Metal detection signal input
2	POWER SWITCH signal input
3	CONVEYOR SWITCH signal input
4	Sensor signal output
5	GND
6	DC +15V output
7	DC -15V output
8	GND
9	DC +5V output
10	GND
11	RS232 RX Signal (power supply board <-> communication between metal detection heads)
12	RS232 TX Signal (power supply board <-> communication between metal detection heads)

### 2. RS232 Input and Output

1	RS232 RX	Printer control input signal
2	RS232 TX	Printer control output signal
3	GND	GND

### 3. RS485 Input and Output

1	RS485 RX	Inverter control input signal
2	RS485 TX	Inverter control output signal
3	GND	GND

### 4. External input signal

1	GND	GND
2	EXT_DEV	External device input signal. Active Low
3	GND	GND
4	EXT_MOT	External motor control input signal. Active Low
5	GND	GND
6	EXT_PWR	External power control input signal. Active Low



Please work it for the safety after disconnecting power input line.

### 5. DIP SWITCH (Revision: A2)

1	TEST MODE	Production testing function On/Off
2	Reserved 2	Special spare switch input
3	Reserved 3	Special spare switch input
4	Reserved 4	Special spare switch input
5	Reserved 5	Special spare switch input
6	Reserved 6	Special spare switch input
7	Reserved 7	Special spare switch input
8	HEAD ON	HEAD auto-start setting when the main power is ON

### 5-1. DIP SWITCH (Revision: B2)

1	TEST MODE	Production testing function On/Off
2	Reserved 2	Special spare switch input
3	Reserved 3	Special spare switch input
4	HEAD ON	HEAD auto-start setting when the main power is ON

### 6. MAIN SWITCH

1	II	Force the motor power ON (metal detector OFF)
2	O	All OFF
3	I	Metal detector main power ON

The location of the number II will be used to drive only conveyor without working metal detector or drive conveyor in the case of conveyor failure.

### 7. Fuse

1	FUSE 2	For single-phase motor 180W input power : Standard (250V/3A), type (Ceramic fuse), length (20mm)
		For single-phase motor 360W input power : Standard (250V/5A), type (Ceramic fuse), length (20mm)
		For single-phase motor 720W input power : Standard (250V/10A), type (Ceramic fuse), length (20mm)
		For three-phase motor magnet input signals : Standard (250V/3A), type (Ceramic fuse), length (20mm)
2	FUSE 3	For head input and external output : Standard (250V/3A), type (Ceramic fuse), length (20mm)



Please DO it for the safety after disconnecting power input line.

### 8. AC Input and Output

1	BUZ L	AC Buzzer connecting terminals Output in relay operation (prime power) Default: operating time output in metal detecting
2	BUZ N	
3	FG	
4	OUT L	Output when power is ON (prime power)
5	OUT N	
6	FG	
7	MOT L	Output when the motor drive (prime power)
8	MOT N	
9	FG	
10	IN L	Prime power input (AC 100V~240V)
11	IN N	
12	FG	

### 9. Option Input and Output

1	DC12V	DC 12V Output
2	GND	GND
3	SOL_V	Solenoid output. Output conditions are specified in the 'sorting setup'
4	GND	GND
5	LAMP BUZ	Buzzer Output (DC 24V only)
6	LAMP R	Red tower lamp signal output (DC 24V only)
7	LAMP G	Green Tower lamp signal output (DC 24V only)
8	GND	GND
9	DC24V	DC 24V output
10	SENSOR	Sensor signal input
11	GND	GND
12	EMER	Belt emergency stop switch input



Please DO it for the safety after disconnecting power input line.

### 10. Tower lamp connections (DC 24V only)

1	GND	GND
2	LAMP BUZ	Buzzer output
3	LAMP R	Red lamp signal output
4	LAMP G	Green lamp signal output

- Power board connector: SMW250-04 (Maker: Yeonho Electronics)
- Tower lamp Connector: SMH250-04 (Maker: Yeonho Electronics)

### 11. Relay Output

1	R1 NO	Relay 1 Normal Open
2	R1 NC	Relay 1 Normal Closed
3	R1 COM	Relay 1 common terminal
4	R2 NO	Relay 2 Normal Open
5	R2 NC	Relay 2 Normal Closed
6	R2 COM	Relay 2 common terminal

The relay output can be used to control an external device in conjunction with a metal detector. The output conditions can be specified in the Sorting Management menu/Sorting Setup.



Please DO it for the safety after disconnecting power input line.

Production method	CLOSED COIL TYPE
Operating Voltage	Single phase 220V / 60HZ AC (Exclude customized products)
Operating Voltage	Max 500W (CONVEYOR MOTOR: 1/2HP)
Operating Temperature	0°C ~ 50°C
Frequency	Single 50, 200, 400KHz, Combined 50+200, 50+400KHz to be selected (Pharmaceutical model: single-400KHz)
Effective pass rate	5m/min ~ 500m/min
Processing capacity	Linked to the speed of the conveyor drive Pharmaceutical model: Max. 10.000ea/Min. (It depends on the size of products)) Fall type model: It depends on the velocity of falling products.
Number of registered products	Up to 100 products
Output Mode	Relay contacts, buzzer, tower lamps, solenoid drive signal, motor stop
Waterproof / Dustproof	IP-66 waterproof/dustproof standard
Other functions	7 inch TFT LCD resistive touch panel 128MByte detection history memory for storing Built-in USB removable disk access port (Detection history storage, built-in software upgrade). Built-in Ethernet Port (TCP / IP connectivity and remote monitoring support) Multi-language support: Korean, English, Japanese, Chinese Built-in serial communication port: RS-232C x 1, RS-485 x 1 Built-in Help Screen for Operation Description Support for product input in Hangul (Korean language) Support for automatic product setting

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