Metal Detector

AD-4971 Series

Capable of detecting metal contaminants in products, this system contributes to the delivery of safe products to customers.
Provides high sensitivity detection with simple and easy operation and contributes to the delivery of safe products to your customers.

You can conduct high sensitivity detection with simple and easy operation. The optimal sensitivity setting can be set through the auto sensitivity settings. The phase tracking function enables minimization of product phase and allows constant high sensitivity inspection.

The display utilizes a high visibility touch panel color LCD with user friendly Graphic User Interface (audio guidance support function included).

Product images can be quickly uploaded to the metal detector from USB memory, making product identification and upload fast and simple.

Products can be divided into 10 different groups, with up to 100 products able to be recorded within each group.

 Protected from dust and water to IP65 standards. Hygienic design with the entire system washable.

Display examples

Normal display

Bar graph display

Lissajous display

Equipped with Modbus RTU/Modbus TCP as standard. With Modbus communication, seamless connection can be easily achieved.

Operations such as stopping and starting inspection, collecting data and changing product can all be set from an external device.
The history of configuration changes can be recorded and displayed. Suitable for use in HACCP programs along with the inspection history function. Users can be registered and their scope of permitted operations controlled according to four management levels: Operator, Supervisor, Quality Manager, and Administrator. By assigning each user to the appropriate level of access, inadvertent operations can be avoided.*

* "Operator" is set as the factory default setting.

**Inspection history**

Inspection results, such as date, time, product codes, and inspection results, can be recorded to USB memory during inspection.

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<thead>
<tr>
<th>Inspection history output example</th>
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<td>Date</td>
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**Data output to USB**

All inspection data (CSV), operation history (CSV), inspection summary data (PDF) and operation check results (PDF) can be outputted to USB memory.

*USB memory is not included. Please prepare separately.

**Graph printing to a printer**

Inspection results and operation check results can be outputted to a PostScript printer via Ethernet.

**Basic principle of metal detection**

A sensor head of an electromagnetic induction type metal detector consists of a transmitter coil and two receiver coils that are equally spaced and are differentially connected. A transmitter coil broadcasts a radio frequency signal and generates an electromagnetic field between the transmitter coil and the receiver coils. When no contaminant exists, both receiver coils receive an equal amount of magnetic flux and differential signal output is balanced at zero. The magnetic flux balance is disturbed and creates a differential output signal when a contaminant passes through the aperture. Metal detectors detect metal contaminants by processing this differential output signal.

![Diagram of magnetic flux balance and eddy current](image.png)
### Common Specifications for AD-4971 Series

- **Conveyor belt width**: 250mm (AD-4971-3510/3517/3525)
- **Conveyor length**: 800mm
- **Transport medium**: Urethane belt
- **Conveyor belt speed**: 10~60m/min
- **Display**: 7inch touch panel color display
- **Operation method**: Touch panel (WVGA), Key switch
- **Number of recorded items**: 1000
- **Communication functions**: Modbus TCP / Modbus RTU / TCP/IP(POSTScript printer)/ USB (for USB memory, data storage, image import use)
- **External input**: Non-voltage contact input 4 points
- **External output**: Relay output 8 points
- **Humidity resistance specifications**: IP65 compliant
- **Operation temperature/humidity range**: 0~40°C / Humidity below 85%(with no condensation)
- **Power supply**: Single phase AC100V~240V(+10%,-15%),50/60Hz,100VA
- **Material**: Base unit: Stainless steel, Control box: ABS resin, Display: ABS resin, Sensor head: Stainless Steel, Conveyor unit: Phenolic resin, stainless steel, aluminum (alumite treatment)
- **Dust/water resistance specifications**: IP53 dust and water resistance levels

### AD-4971 Series Specifications

#### AD-4971-3510
- **Aperture size**: 350 mm (W) x 100 mm (H)
- **Detection sensitivity**
  - Fe: Ø0.3 mm, SUS: Ø 1.0 mm
- **Display**: Touch panel
- **Conveyor unit**: Phenolic resin, stainless steel, aluminum (alumite treatment)
- **Base unit**: Stainless steel

#### AD-4971-3517
- **Aperture size**: 450 mm (W) x 170 mm (H)
- **Detection sensitivity**
  - Fe: Ø0.5 mm, SUS: Ø 1.0 mm
- **Display**: Touch panel
- **Conveyor unit**: Phenolic resin, stainless steel, aluminum (alumite treatment)
- **Base unit**: Stainless steel

#### AD-4971-3525
- **Aperture size**: 450 mm (W) x 250 mm (H)
- **Detection sensitivity**
  - Fe: Ø0.7 mm, SUS: Ø 1.0 mm
- **Display**: Touch panel
- **Conveyor unit**: Phenolic resin, stainless steel, aluminum (alumite treatment)
- **Base unit**: Stainless steel

### Operating Precautions
1. Decide where in the production process to install the metal detector by assessing the risk of metal contamination.
2. For raw materials with a lot of metal contaminants, install a metal detector before processing begins.
3. For products packed in aluminum foil packages, install a metal detector before the packaging process.
4. Dedicated 100-240V wiring with low noise is advised.
5. Make sure to ground the metal detector.
6. Remove vibrating or shifting metals near the sensor head.
7. Make sure ground loops are not created by nearby equipment.
8. Please prepare a Φ4-7mm power cable.

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*Optional tower lights are illustrated in blue.*

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