Anritsu

X-ray Inspection System

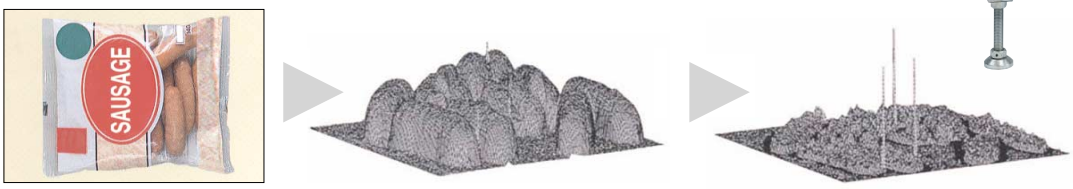
Compact, easy to operate and extremely safe
Assuring safe and secure production lines

High detection sensitivity

Stainless steel wire of 0.28 mm diameter as well as non-metallic contaminants can be detected.

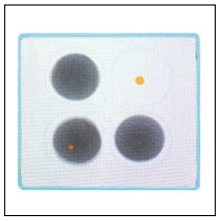
Our advanced sensor technology and unique image processing technology enable extremely small contaminants such as ferrous (Fe), stainless steel (SUS) and others to be detected.

- Ferrous and stainless steel sphere of 0.3 mm diameter are detected.
- Non-metallic contaminants such as bone, shell, stone, glass, rubber, and plastic are detected.
- Stainless steel wire of 0.28 mm diameter is detected.



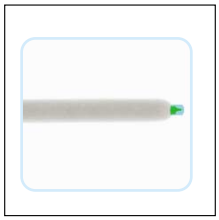
Masking function

Parts that should not be detected such as metal clips for wrapping or containers are automatically masked, which assures more sensitive detection of contaminants.



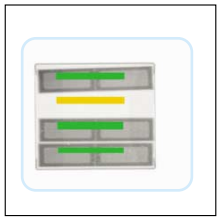
Clip check function

Wrapped products sealed with metal clips at both ends (sausage, processed cheese, etc.) can be checked for missing clips simultaneously with contaminant detection.



Missing product detecting function

Missing product can be checked simultaneously with the detection of contaminants in food products, thus greatly improving quality control efficiency.



Multi-line Inspection Function

One X-ray Inspection System can inspect products on two lines if the products are identical. This is useful for saving space (requires optional photocell and product guides).

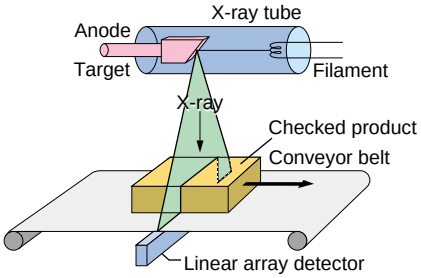
- Comparison between sensitivity of X-ray inspection system and metal detector (In-house comparison)

		X-ray Inspection System	Metal Detector
contaminants only	Fe Sphere	0.3 mm dia.	0.4 mm dia.
	SUS Sphere	0.3 mm dia.	0.7 mm dia.
Sausage	Fe Sphere	0.6 mm dia.	1.0 mm dia.
	SUS Sphere	0.6 mm dia.	2.0 mm dia.
	SUS Wire	0.28 mm dia. x 2-mm long	2.0 mm dia.
	Bone chip	1.0 to 2.0-mm thickness	Undetectable
Aluminum packaged food product	Fe Sphere	0.5 mm dia.	2.0 mm dia.
	SUS Sphere	0.5 mm dia.	Undetectable
	Bone chip	1.0 to 2.0-mm thickness	Undetectable

Note: Actual detection sensitivity depends on the physical properties of the checked products (such as content and shape).

- Principle of detection of contaminants by X-ray

X-rays are radiated from X-ray tube at food and chemical products carried in on the conveyor, and the degree of penetration of the X-rays is measured by a linear array detector placed under the conveyor. Using our exclusive image processing technology, highly sensitive analysis of the measured signal is carried out to detect contaminants included.



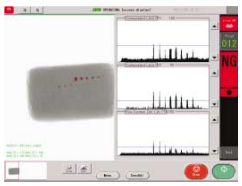
Clear, large 15" LCD screen

Highly improved operability

- Easy-to-operate LCD touch panel
- Enhanced operability with integrated operation screen and X-ray image monitoring screen
- Operation screens for various requirements (Statistics Display Screen, Limit Change Screen, X-ray Image Monitoring Screen)
- Captured-image zoom function
- Color-coded limit settings as well as waveform display of processed image
- Saves up to 100 operating images (option)
- Auto-setting of optimum product limits
- Online screen Help function shows usage
- Troubleshooting functions

Image monitoring screen　　Operation screen

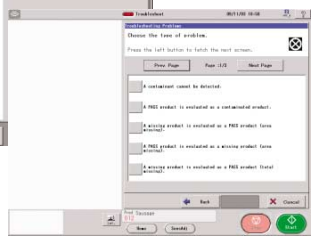
Zoom-in image display screen



Projection monitor screen

Detection limit change screen

Error screen



Troubleshooting screen

HACCP Compliant

Made of clean and hygienic stainless steel for easy cleaning and maintenance

- Highly reliable direct conveyor drive
- The conveyor part is washed down for cleaning (IP66 compatible).
- Front cover, belt and rollers are easily attached or detached.
- Removable shield curtain (option)

Direct conveyor drive

Carrying belt is easily attached or detached.

Removable shield curtain (option)

Safe design

Priority is given to prevention of X-ray leakage.
Operator safety is of utmost importance.

Exclusive ANRITSU safety mechanism

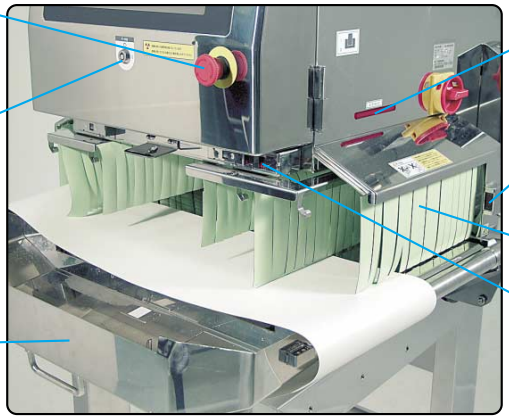
Emergency stop switch

X-ray irradiation ON/OFF key

Turning the key to OFF stops X-ray irradiation completely.

X-ray shield cover

Can be opened or closed only when irradiation is completely stopped.



X-ray irradiation display

The lamp is lit while X-rays are being irradiated.

Monitoring sensor for hand insertion

When the sensor is interrupted for a certain period of time, X-ray irradiation is stopped.

Leakage prevention curtain

Prevents X-ray leakage.

X-ray shield cover open/close sensor

This sensor detects opening and closing of the X-ray shield cover.

Safety of X-rays and regulatory constraints

(1) Safety of checked products

- WHO concluded in 1980 that "food products irradiated with 10 kGy or lower level of X-rays present no problem in terms of toxic level, nutritional value, and microbiological aspects".
- The maximum X-ray irradiation level by our X-ray inspection system to the checked product is 0.001 Gy or less, which is much lower than the value designated by WHO standard.
- If the product being checked happens to stop moving during X-ray irradiation, X-ray irradiation is stopped to keep the irradiation level to 0.1 Gy or below.

(2) Safety for humans

- We are always exposed to radiation: In the natural world, we receive irradiation of 1100 µSv a year on average, and in the case of a chest X-ray, 300 µSv in just one time. (the unit µSv [micro Sievert] indicates the radiation level of X-rays)
- The X-ray leakage level of our X-ray inspection system is 1 µSv/h or lower (1.3 mSv/3 months or lower)

Note: 3 months = 13 weeks (52 weeks is one year)
1 µSv/h x 16 hours x 6 days x 13 weeks = 1.25 mSv/3 months

Safety management

X-ray Inspection System has been designed to fully satisfy the safe operation. However, to ensure even higher safety, use the following safety procedures outlined below.

1. Periodical measurement and record storage of X-ray leakage dose of X-ray Inspection System.

2. Manage and record the working hours of X-ray Inspection System operators.

3. X-ray Safety Measures

Depending on the product shape, weight and packaging, it may be necessary to fit X-ray leakage prevention covers to the upstream and downstream conveyors, instead of using X-ray leak prevention curtains.

4. Never disassemble or modify the X-ray Inspection System or the upstream and downstream equipment.

NEVER modify or disassemble the main unit, covers, X-ray leak prevention curtains, safety covers, safety interlocks, etc., otherwise the X-ray leak-proof design may no longer be satisfied.

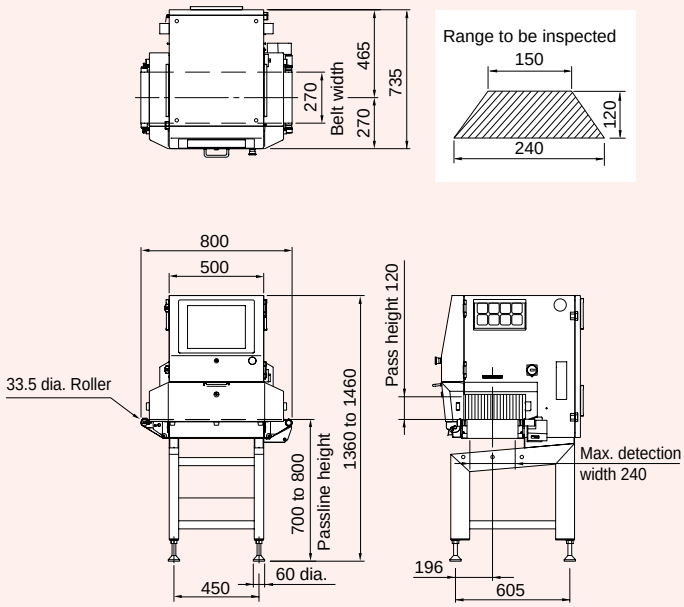
KD7305AW

Stainless steel wire of 0.28 mm diameter x 2-mm long can be detected.
Contaminants in single packages and contaminants in tall products up to 120-mm pass height can be detected at high sensitivity.

KD7305AW

External Dimensions

KD7305AW



Units: mm

Specifications

Model	KD7305AW
Detection sensitivity Note 1	Fe sphere and SUS sphere 0.3 mm dia., SUS wire 0.28 mm dia. x 2 mm long
X-ray output	Max. 60 kV, 210 W (variable voltage and current)
Safety	X-ray leakage dose: Max. 1 µSv/h or less, Prevention of X-ray leakage by safety device
Display	15-inch Color TFT LCD (unified image monitoring screen and operation screen)
Operation method	Touch panel
Product size Note 2	Max.width: 240 mm, Max. height: 120 mm
Belt width	270 mm
Masking function	Equipped as standard
Missing product detection function	Equipped as standard
Clip check function	Equipped as standard
Preset memory	Max. 100 products
Belt speed	5 to 90 m/min (variable speed depending on Product No.)
Max. product weight Note 3	5 kg (2 kg when belt speed exceeds 60 m/min), [Option: 10 kg at 5 to 40 m/min]
Power requirements	200 to 240 Vac ±10%, single phase, 50/60 Hz, 1 kVA, rush current 80 A (typ.) (5 ms or less)
Mass	230 kg
Environmental conditions	Temperature 0º to 35ºC (0º to 40ºC with optional air conditioner), relative humidity 30% to 85%, no condensation
Protection class	IP66 Compliance (for conveyor), IP42 Compliance (for other parts), one-touch removal belt
Casing material	Stainless steel (SUS304)

Note 1: Actual sensitivity depends on the physical properties of checked products(contents and shape) and on the environmental conditions.
Note 2: The inlet and outlet may require covers, depending on the length and weight of checked products.
Note 3: Sum total of checked product weight on the conveyor

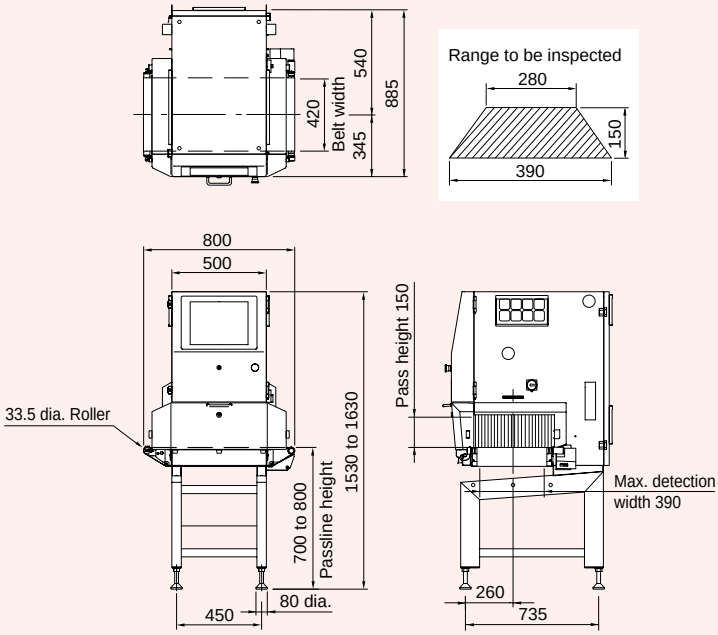
KD7316AW

Contaminants in large and wide products
and products in bulk can be detected

KD7316AW

External Dimensions

KD7316AW



Units: mm

Specifications

Model	KD7316AW
Detection sensitivity Note 1	Fe sphere and SUS sphere 0.4 mm dia., SUS wire 0.28 mm dia. x 2 mm long
X-ray output	Max. 60 kV, 210 W (variable voltage and current)
Safety	X-ray leakage dose: Max. 1 µSv/h or less, Prevention of X-ray leakage by safety device
Display	15-inch Color TFT LCD (unified image monitoring screen and operation screen)
Operation method	Touch panel
Product size Note 2	Max.width: 390 mm, Max. height: 150 mm
Belt width	420 mm
Masking function	Equipped as standard
Missing product detection function	Equipped as standard
Clip check function	Equipped as standard
Preset memory	Max. 100 products
Belt speed	5 to 60 m/min (variable speed depending on Product No.)
Max. product weight Note 3	5 kg, [Option: 10 kg at 5 to 30 m/min]
Power requirements	200 to 240 Vac ±10%, single phase, 50/60 Hz, 1 kVA, rush current 80 A (typ.) (5 ms or less)
Mass	290 kg
Environmental conditions	Temperature 0º to 35ºC (0º to 40ºC with optional air conditioner), relative humidity 30% to 85%, no condensation
Protection class	IP66 Compliance (for conveyor), IP42 Compliance (for other parts), one-touch removal belt
Casing material	Stainless steel (SUS304)

Note 1: Actual sensitivity depends on the physical properties of checked products(contents and shape) and on the environmental conditions.
Note 2: The inlet and outlet may require covers, depending on the length and weight of checked products.
Note 3: Sum total of checked product weight on the conveyor

Applied X-ray inspection systems for various products

KD7305ABW/ KD7316ABW for bulk products

The KD7305ABW/ KD7316ABW are used to detect contaminants in unpackaged bulk products, such as meat, fish, etc., when X-ray leakage prevention curtains cannot be used.

Features:

1. Short length (1570 mm)
2. Less than 1 µSv/h X-ray leakage
   (without X-ray leakage prevention curtains)
3. IP66-compliant conveyor
4. 50-mm detection height and 240-mm detection width (KD7305ABW)

For wide products, use the KD7316ABW (390-mm detection width).

Note: Optional work tray

KD7305ACW/ KD7316ACW for lightweight and small packages

The KD7305ACW/ KD7316ACW are used to detect contaminants in lightweight and small packaged products that can be canght easily in X-ray leakage prevention curtains.

Features:

1. Short length (1340 mm)
2. Less than 1 µSv/h X-ray leakage
   (without X-ray leakage prevention curtains)
3. IP66-compliant conveyor
4. 50-mm detection height and 240-mm detection width (KD7305ACW)

For wide products, use the KD7316ACW (390-mm detection width).

Note: Optional tower light

For products packed in cup

With upstream and downstream conveyors

This example is used to detect contaminants in tall products, such as pot noodles, etc., that are easily toppled over by the X-ray leakage prevention curtains.

Features:

1. IP66-compliant conveyor
2. 120-mm detection height and 240-mm detection width

Rejector

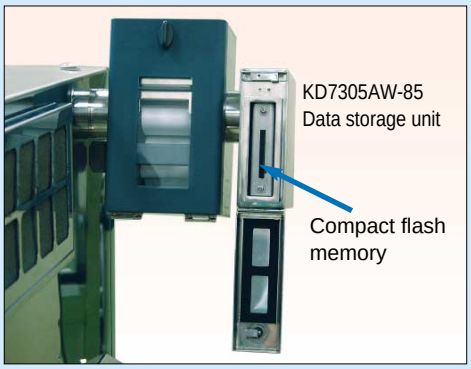
Flipper type
KW4103AW
KW4104AW

Air Jet type
KW4822BW

Dropout type
KW4672DW
KW4673DW

Option

KW2002AW Printer



• Printing Example

History printing

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03/01/29 08:30:25          001
Power ON
03/01/29 08:32:00          001
Stop
03/01/29 08:32:10          001
Sens. adj.
03/01/29 08:32:25          001
Operation
03/01/29 17:30:10          001
Stop
03/01/29 17:30:15          001
Power OFF
==========
```

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Print time          03/01/29 09:30
03/01/29 08:30:25 Contaminant 011
03/01/29 08:30:47 Missing prod 011
03/01/29 08:32:35 Missing prod 011
03/01/29 08:35:12 Contaminant 011
03/01/29 08:36:37 Contaminant 011
03/01/29 08:36:56 Contaminant 011
03/01/29 08:40:28 Ctm/Miss      011
03/01/29 08:45:21 Contaminant 011
03/01/29 08:48:31 Ctm/Miss      011
03/01/29 08:52:54 Contaminant 011
03/01/29 08:56:02 Missing prod 011
03/01/29 08:58:32 Contaminant 011
==========
```

Individual printing

Anritsu

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• In addition to daily inspection, an annual maintenance check should be carried out.

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