

ELEKTRONIK SYSTEM

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DUAL ENERGY X-RAY SCANNER ELEKTRON-SXRF-4080 DE-FC

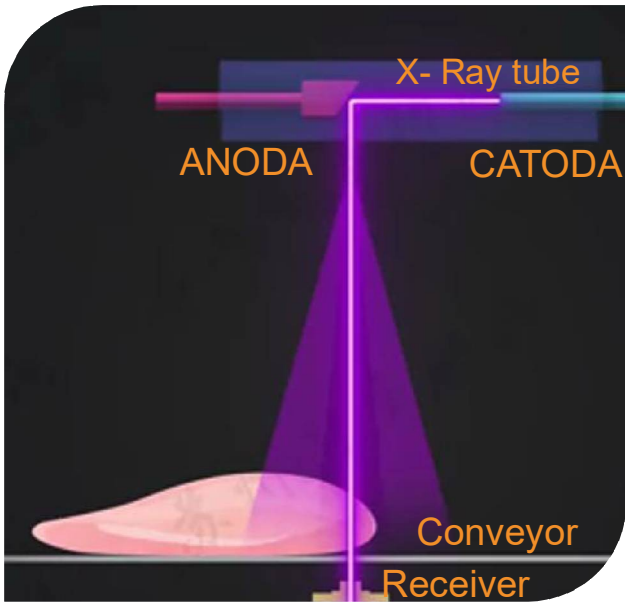
DUAL ENERGY supported by ARTIFICIAL INTELLIGENCE

- ▶ X- Ray scanner designed for the examination of bulk products such as cuts of meat, offal, fish.
- ▶ **PHOTON** X-Ray detector combined with **DUAL ENERGY** technology provides the highest level of sensitivity available on the market.
- ▶ The main purpose is to remove bones from meat and bones from fish. It is excellent at finding foreign bodies such as ceramics, glass, rubber and hard plastic.
- ▶ Designed for easy and quick cleaning.
- ▶ Highest level of safety, meeting European CE standards as well as American FDA standards, UL/CSA optional.
- ▶ Possibility of adapting the device structure to the conditions of the production line (longer conveyor, higher IP protection level, SUS316 construction, conveyor height).

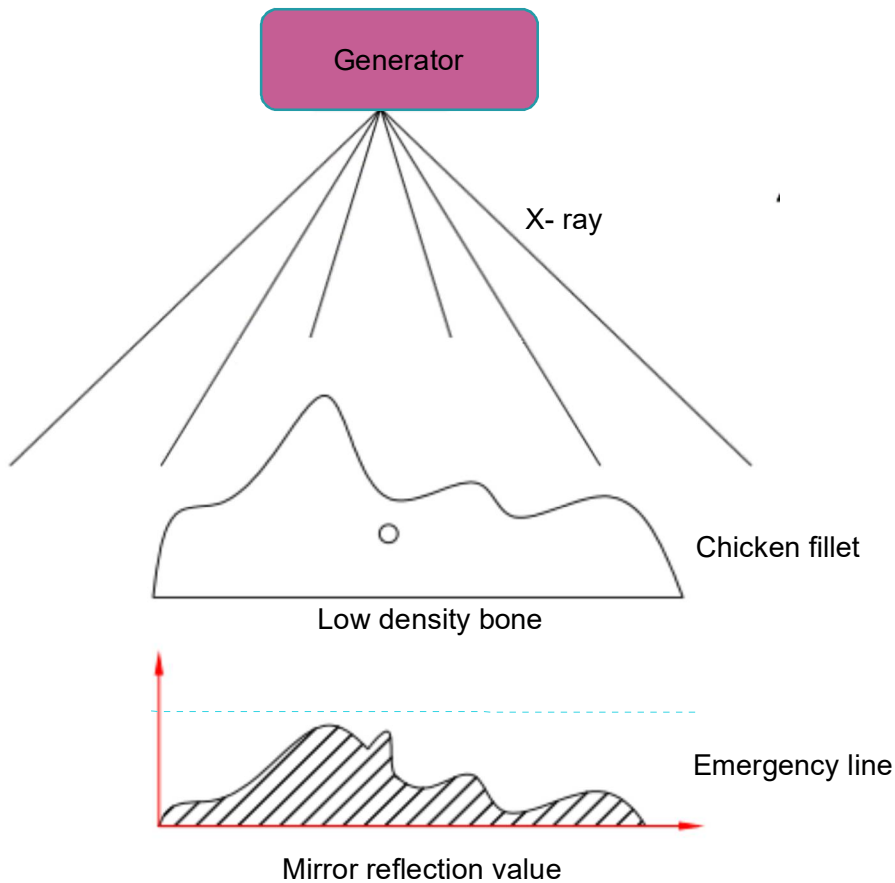
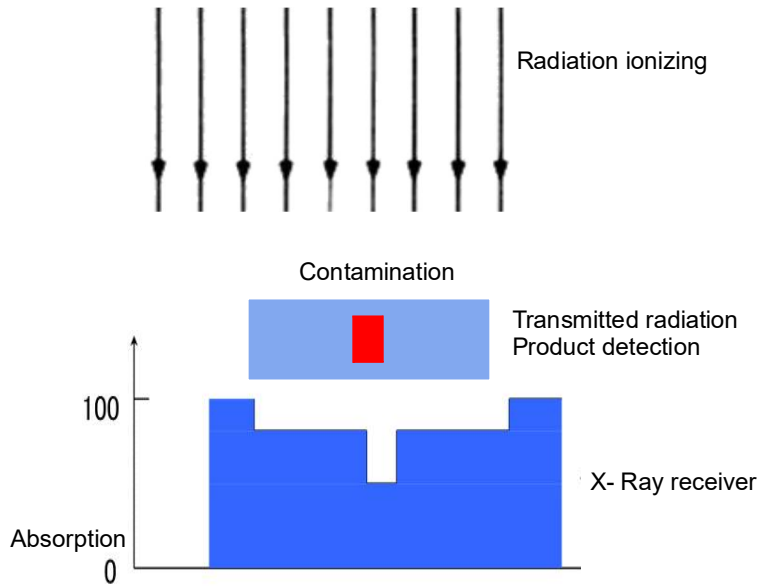


Model	ELEKTRON-SXRF
Specification	4080 DE-FC
Maximum height of the test product	100 mm
Maximum width of the test product	400 mm
X-ray lamp	MAX. 80 kV, 350W
The smallest possible detectable testers	St/st ball from 0.3 mm, wire from 0.2x2 mm Glass/Ceramic ball from 1.0 mm
Tape speed	Adjustable in the range of 0-40 m/min
Display	17" touch screen
Cooling	Industrial air conditioner
Radiation protection	Protective tunnel and security system
External radiation	< 0.5µSu/h
Working temperature	from -10°C to 40°C
Working humidity	30-90% non-condensing water vapor
Supply voltage	230VAC
Power consumption	1200W
Tightness class	IP66
Air pressure	0.8Mpa
Housing material	Glass-blasted stainless steel

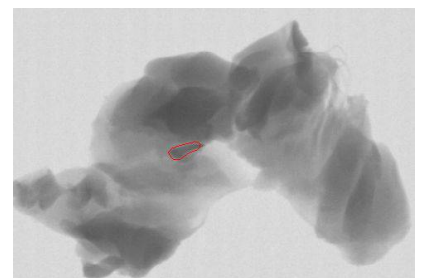
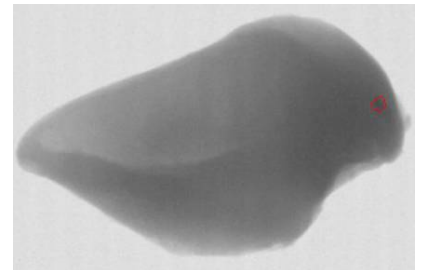
Standard single-lamp scanners have the ability to adjust the ionizing radiation beam to of a given product in one scope. Depending on the density of the product, it increases to the same extent to absorb radiation, which often makes it impossible to find very small contaminants, and in especially bones and bones. However, in other industries it works perfectly.



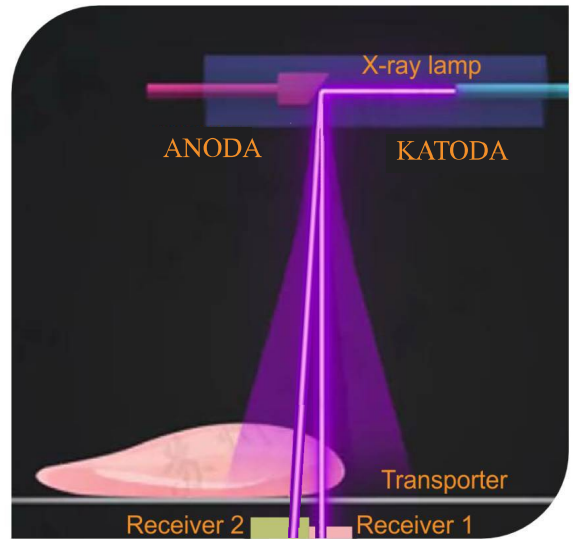
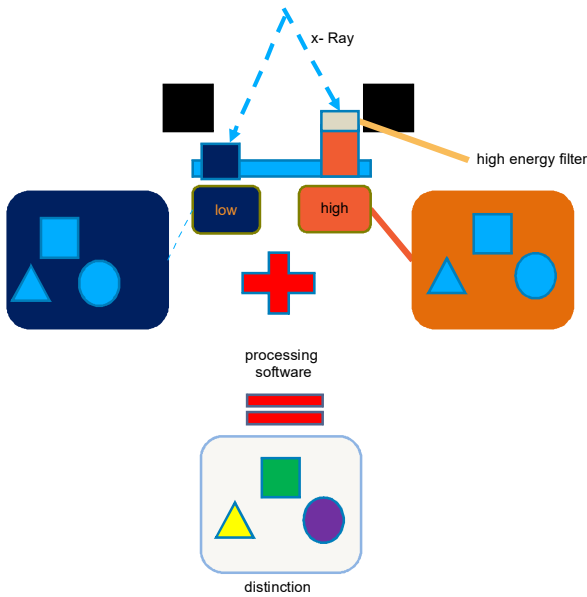
Inspection theory



It is easy to find contaminants metal, hard bones.

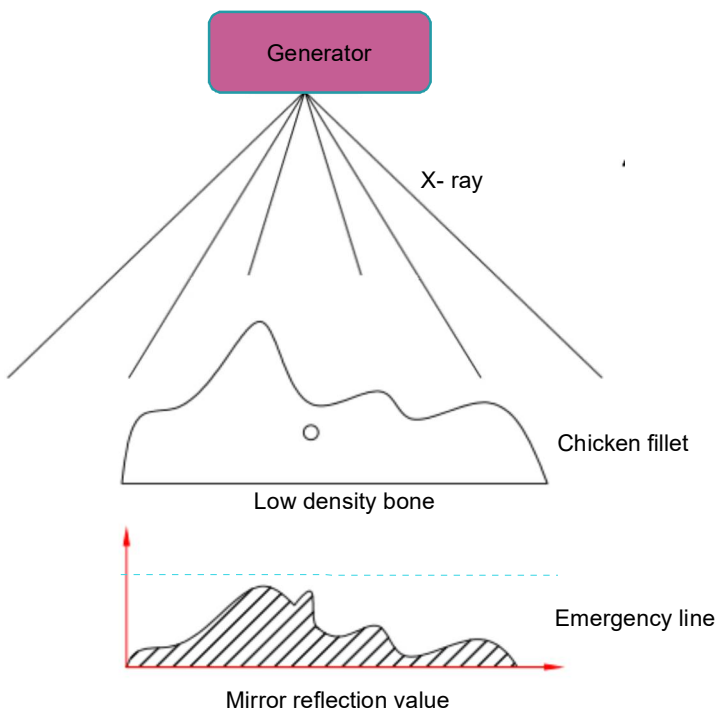


The **ELEKTRON-SXRF-4080DE** X-Ray scanner uses dual-energy beams on two different levels. The first beam of ionizing radiation goes to the attenuating receiver. This effect occurs when the beam is filtered on part of the receiving system. Then the scanner generates a second high-energy beam to the second part of the receiver, analyzes the scanned object and image comparison. The high and low energy signals obtained by the dual energy system are sent to the computer, which are calculated based on the processed data and associated values with the equivalent atomic number of the substance. The software automatically compares images of high and low energy, analyzes whether there is a difference in the atomic number of the recorded standard and the body foreign using a hierarchical algorithm.

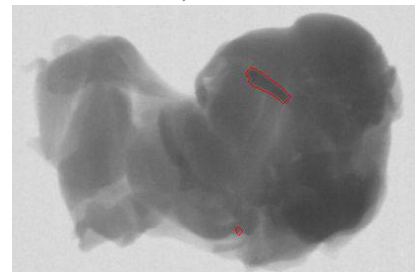


X-Ray scanner with dual energy receiver

- ▶ slight differences between the density of contaminants and the product can be detected
- ▶ many algorithms can be used to separate contaminants



Contaminants are easy to find
metal, hard bones.

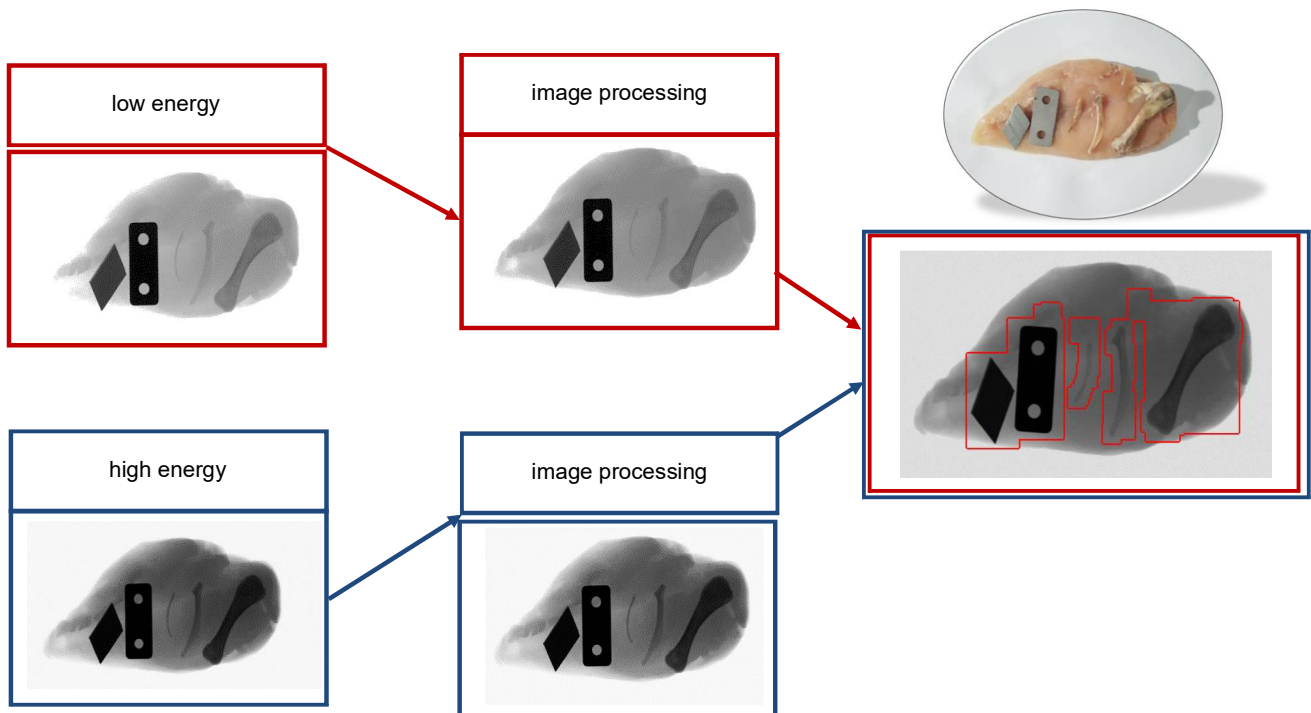


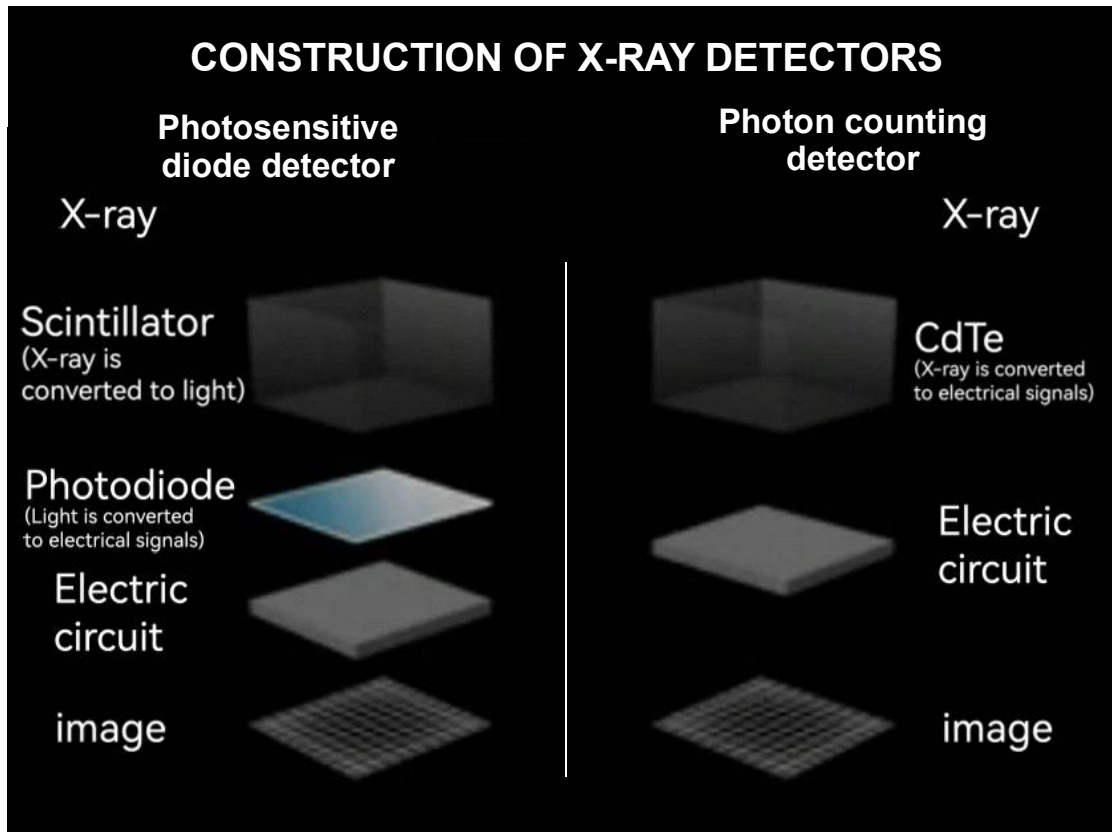
The bones of the ribs and sternum are hard to see
due to its very low density



X-Ray scanner with new receiver + intelligent algorithm = best performance

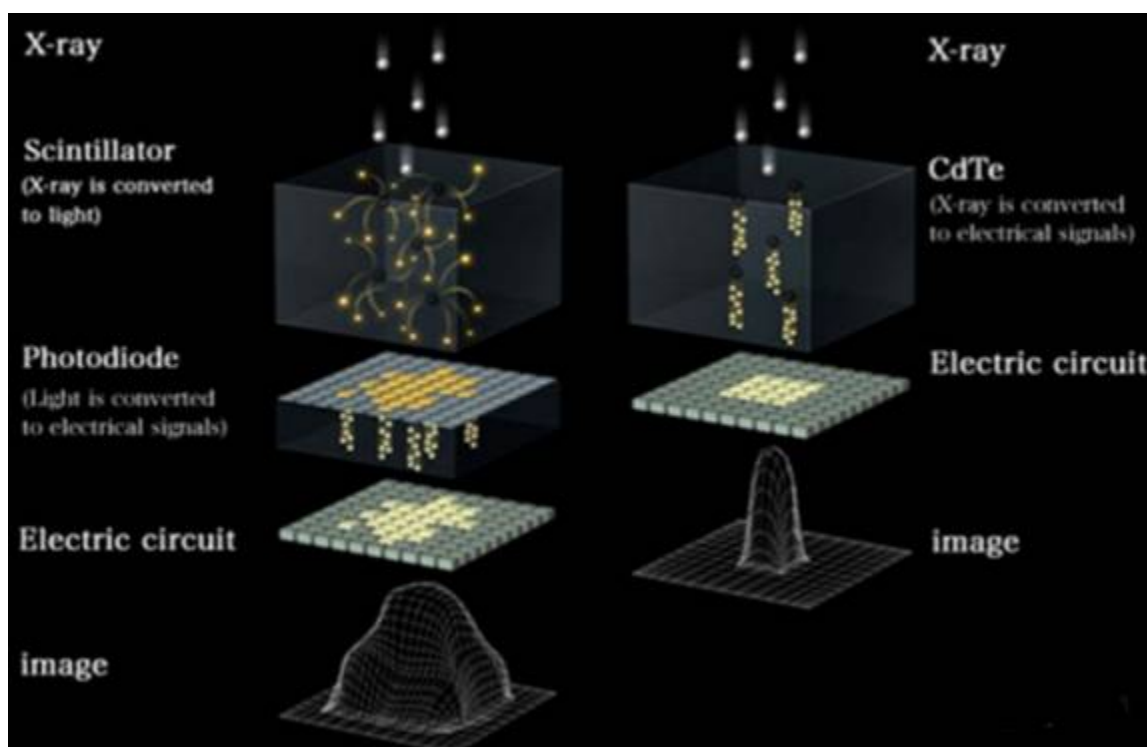
The dual energy system enables easier detection of low-density bone debris, e.g. in chicken fillet





PHOTON COUNTING HAS FOUR ADVANTAGES OVER CONVENTIONAL DETECTOR TECHNOLOGY:

1. Better spatial resolution (100 μm resolution 64-line), Direct Conversion avoids scattering made by the scintillator.
2. Much Longer lifetime and almost zero-deterioration under X-ray exposure.
3. Better SNR of X-ray image because of Zero dark noise.
4. Multi-Energy Xray differentiation can be achieved.



The X-Ray scanner can be equipped with the support of artificial intelligence, which analyses the comparison data much more accurately than a human with tremendous computational speed. The AI robot learns to recognise and eliminate foreign bodies, errors, damage, deficiencies much more accurately than competitor scanners.

MAIN FEATURES

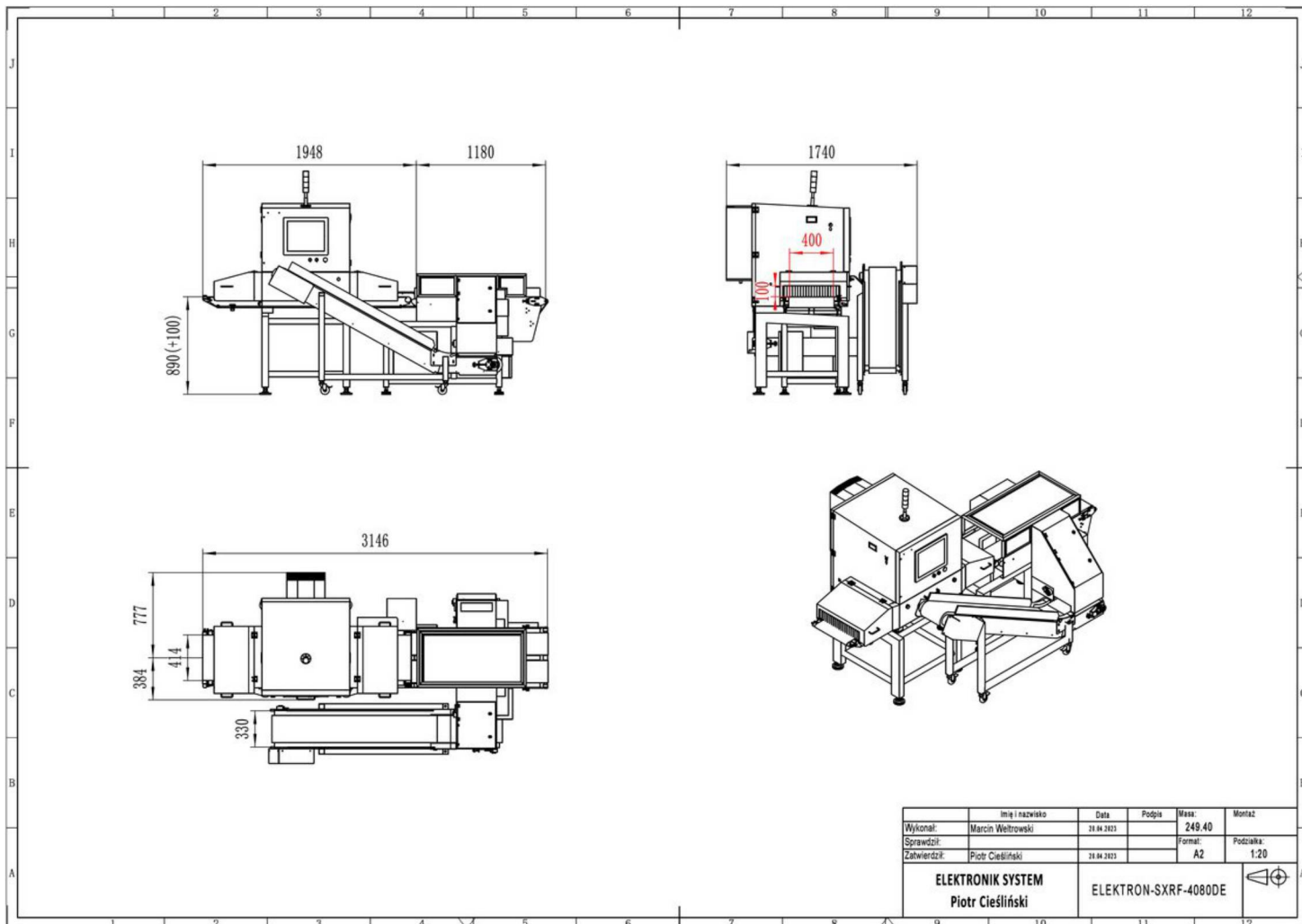
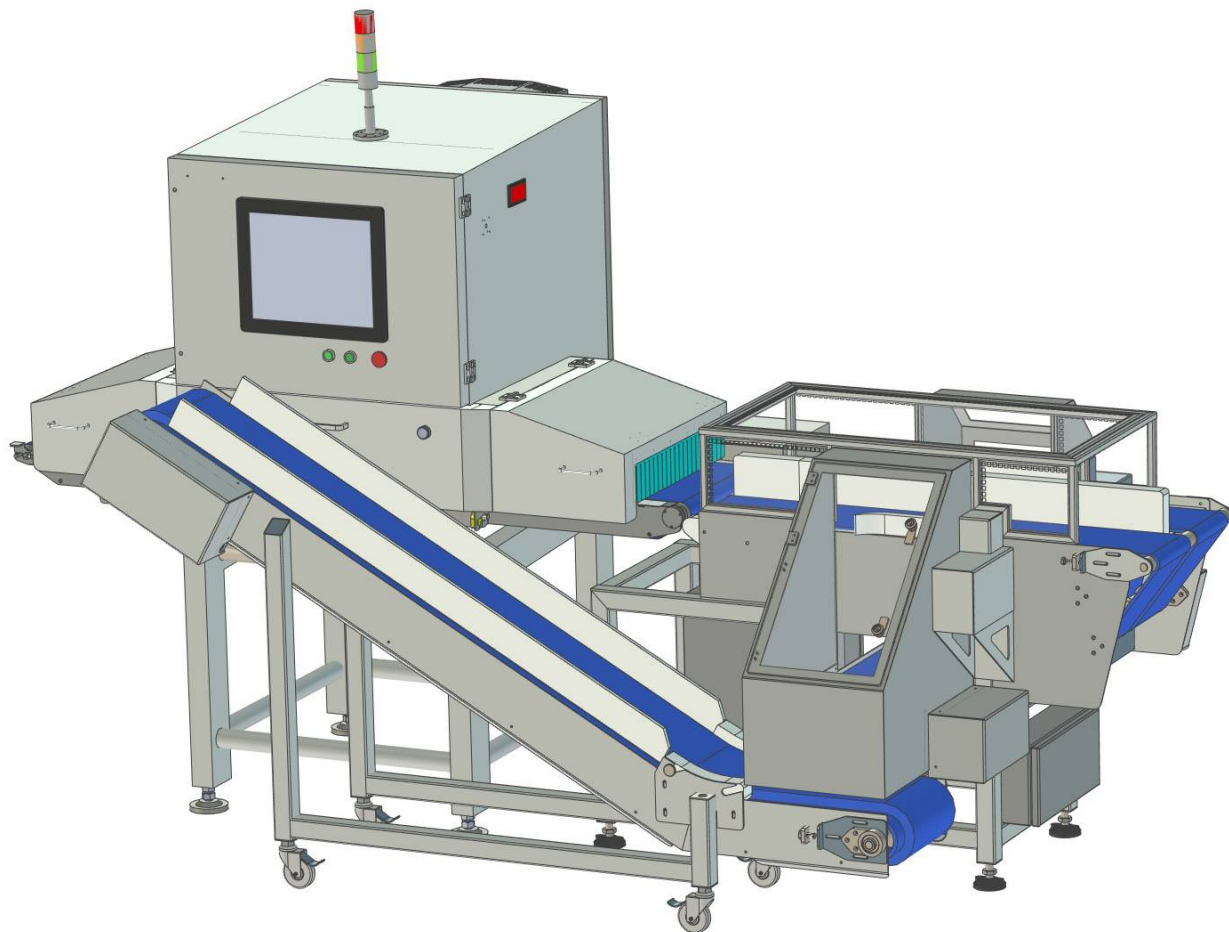
- Easy-to-clean design (to the maximum extent devoid of nooks and crannies, which prevents the growth of bacteria),
- High-quality detection imaging system,
- High level of detection provides multi-level **DE** receiver with 0.4mm automatic filter,
- TDI technology (TDI transforms multiline matrix image into a single-line linear image matrix by signal accumulation, increased detector exposure level used 8-level receiver. That means on this one same dose of X-rays the TDI detector can get 8 times higher exposure than a standard array detector linear.
- The intelligent algorithm is responsible for:
 - ✓ Self-organizations of all components,
 - ✓ Self-adaptation,
 - ✓ Automatic signal synchronization between the radiation lamp ionizing device and the receiver,
 - ✓ Auto learning for continuous supervision over the reliability of the scanner operation.

„FROST” SYSTEM

In the low temperature zone, the X-Ray scanner can be equipped with an unprecedented "FROST" system- a system for controlling the temperature and humidity inside the enclosures of the control systems. A system that protects the electronics against humidity and cold and abrupt temperature changes during cleaning. It prevents the absorption of moisture inside (e.g. a cold machine washed with hot water).

LIST OF COMPONENTS

FUNCTION	NAME	PRODUCER
X-Ray source	X-Ray generator	VJ USA
X-Ray receiver	X-Ray detector	DT FINLANDIA
Device management	17" touch monitor	ADVANTECH
Data processing	Industrial computer	ADVANTECH
Temperature and wetness control	Air conditioner	RITTAL
Conveyor belt drive	Engine wiht gear	ORIENTAL MOTOR
Speed regulation	Engine controller	ORIENTAL MOTOR
Electric protection	Miniature circuit breakers	SCHNEIDER ELECTRIC /ABB
Connection between devices	Military connectors	PLT
Safety management	Limit switches	OMRON
Automation management	PLC driver	SCHNEIDER ELECTRIC
Warning information	Optical-acoustic signaller	WERMA



VISUALISATIONS OF THE ELECTRON-SXRF-4080DE SCANNER WITH BI-DIRECTIONAL SEPARATOR

