

# Y.MU231

## Inline wheel inspection system



- The most successful X-ray system in its class
- High product throughput
- High system uptime
- Easy, intuitive operation

High product throughput and system uptime are of primary importance when cast aluminum disc wheels are inspected on a production line using X-rays. The unique shuttle conveyor technology contained in the Y.MU231 along with its patented L-chains provide for short cycle times and low amounts of downtime. As with all X-ray equipment from YXLON, the image quality is first-rate.

Using optional Y.AI software the system can work on a fully automatic basis without having an operator run the system. The high degree of repetitive accuracy ensures a minimum rate of pseudo-rejects. A regular monitoring of image quality guarantees consistent inspection quality. As a result, inspection decisions are made with certainty.

The systems work on a cross-linked basis and generate extensive statistics in real time. This information is utilized to stabilize and improve the casting process itself.

YXLON. X-ray technology at its best.



1 Y.MU231 cabinet  
 2 Finished wheel  
 3 Calibration step wedge

Inspection items	Y.MU231	Y.MU231 XL
<b>Wheels:</b>	4J x 12" to 12J x 20"	4J x 12" to 12J x 24"
<b>Height, incl. sprue (max.)</b>	350 mm	400 mm
<b>Diameter (max.)</b>	550 mm	650 mm
<b>Weight (max.)</b>	30 kg	50 kg
<b>Inspection item temperature</b>	5° C – 100° C	5° C – 100° C

Radiation-shielded cabinet	Y.MU231	Y.MU231 XL
<b>Dimensions (W x H x D)</b>	3,150 mm x 2,300 mm x 2,400 mm	4,500 mm x 2,250 mm x 2,800 mm
<b>Service doors</b>	2,000 mm x 1,000 mm	2,000 mm x 1,000 mm
<b>Leaded-glass pane</b>	400 mm x 600 mm	400 mm x 600 mm
<b>Weight</b>	7,500 kg	7,000 kg
<b>Connection height conveyor system</b>	800 mm	800 mm

X-ray system	Y.TU160-D05
<b>Model</b>	Y.TU160-D05
<b>Tube voltage</b>	8 kV – 160 kV
<b>Tube current (max. at 160 kV)</b>	6,25 mA
<b>Power output (max.)</b>	1.000 W
<b>Focal-spot size (EN12543)</b>	1.0 mm x 1.0 mm

Connection values	5° C – 35° C
<b>Environmental temperature</b>	5° C – 35° C
<b>Air humidity (max.)</b>	80%, not condensing
<b>Power connection</b>	3 N PE 400 VAC +10% – 15%, 50/60 Hz
<b>Energy consumption</b>	4.5 Kw
<b>Compressed air</b>	4,000 l/h, min. 5 hPa



1 As-cast wheels  
2 Y.MU231  
operating console



## Task

As with nearly all casting techniques, irregularities can occur during the production of cast aluminum wheels, too. They are not allowed to endanger wheel stability, and any optical defects on the surface are not permitted, either. The Y.MU231 X-ray system finds these irregularities with consistent reliability.

The greater part of the inspection takes place using individual images which, when viewed together, cover the entire wheel. The inspection decision is made either by the operator or by Y.AI software using ADR (automatic defect recognition). Depending on the case involved, the wheel can also be X-rayed in manual mode.

## The leading wheel inspection system

With over 200 systems sold, the Y.MU231 family is the most successful X-ray-based wheel inspection system of all time. Especially its robustness and the high uptime associated with this make it the most popular system in the world.

## Operating console for foundries

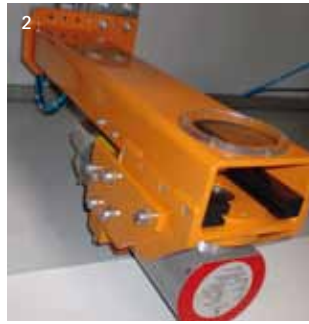
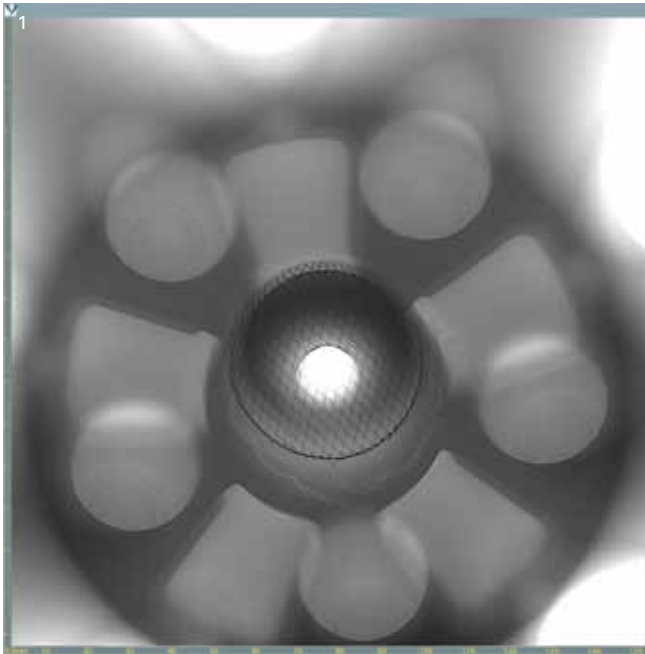
The operating console is customized to meet the requirements of modern foundries. Equipped with industrial proven components and climatization as a standard, the console is suitable for harsh environments. It has been designed as an upright console to ensure easy accessibility.

All relevant information can be captured at the console at a glance. From the X-ray control unit to an industrial PC and on to Y.AI software using ADR, everything is housed in one console.

## Options

YXLON offers a multitude of options for the Y.MU231 family:

- Y.AI for fully automatic X-ray inspection
- L-chain for the highest upring and accurate positioning
- Automatic wheel recognition system
- Statistics server to improve the casting process
- Step wedge for regular auditing of image quality
- Calibration wheel for comparing multiple systems
- Digital camera for image intensifier
- 9-inch Y.XRS233 image intensifier
- 12-inch Y.XRS303 image intensifier
- Motorized magnification axis



1 X-ray image of the hub  
 2 X-ray tube  
 3 Wheel and detector

## Y.AI for fully automatic inspection

Y.AI software provides an objective, precise and repeatable inspection of X-ray images at a speed far superior to the abilities of a human operator. Meanwhile nearly all systems delivered include this option.

Each region of the wheel can be tested while applying different specifications for inspection. The quality called for in each particular region is attained while achieving a minimum of pseudo-rejects.

Extensive statistics regarding wheel inspection are generated via the software. They can be retrieved in real time and merged on a statistics server. This data helps to enable targeted interventions within the casting process. After a short time, the success of such interventions can already be controlled on the next wheel.

## Assured quality at all times

In the case of Y.MU231 together with Y.AI software, inspection quality can be safeguarded at any time. Upon commission of operation, a comparison between systems is achieved and logged using a calibration wheel. The spread in measurement findings can be calculated via a repetition test. This is then taken individually into consideration in terms of the tolerances stipulated by a given inspection specification.

The step wedge tests the imaging system consisting of an X-ray tube and detector automatically according to a defined interval, then archives the results. This ensures that quality specifications are always being fulfilled. Aging processes are visualized like this, enabling replacement to be scheduled preventively and on a timely basis.

Following installation of a new inspection program, a document is generated that contains the new settings. All modifications made later on are recorded. The system's inspection quality and its readiness for deployment are thus assured at all times.

**YXLON**

Technology with Passion

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