



GENUS FOCUS


In-ovo sexing

The next step in hatchery
automation

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The next step in hatchery automation

Dear reader,

Orbem is a deep-tech company based in Munich. Funded by the European Union, we develop imaging solutions to build a sustainable and healthy future for the poultry sector. For the first time, we introduced MRI for industrial applications in the — market. The technology is radiation-free and suitable for both human and animal use. We employ it to reveal what is hidden behind the eggshell without touching it. We can scan, classify, and sort eggs into the following categories: fertilized and unfertilized (day zero of incubation), male, female, and clear (day 12 of incubation and prior), and other phenotypes.

Our top-tier, international, diverse, and multidisciplinary team strives to imagine new frontiers for our food systems.

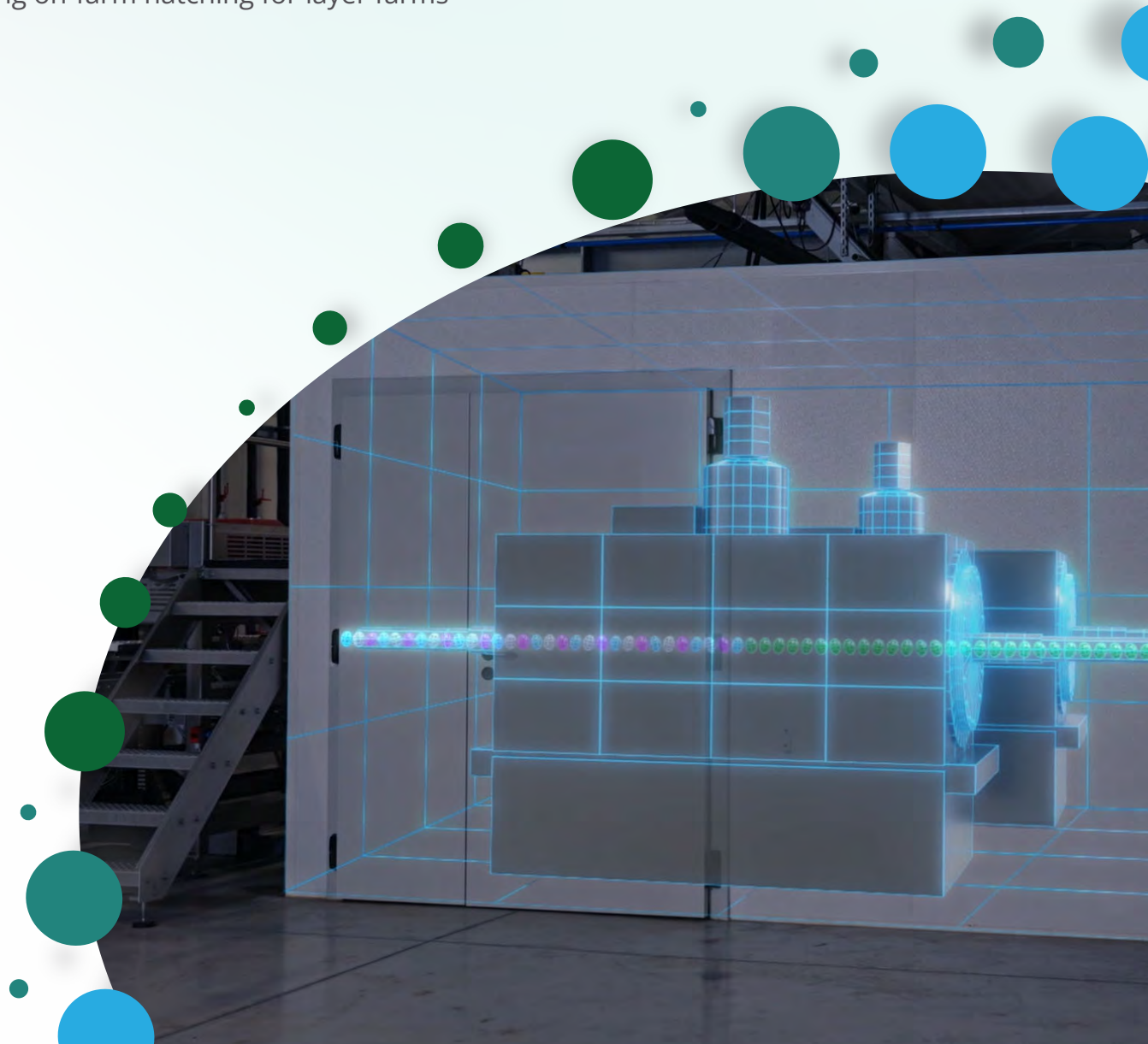
The Genus Focus technology is the modular solution based on Orbem's AI-powered imaging with the Vencomatic Group's automation equipment. It enables reliable and non-invasive real-time sex determination of poultry embryos on day 12 of incubation or before, with a throughput of up to 24,000 eggs per hour.

Vencomatic Group is always thinking ahead with poultry people for the past 40 years. They offer unique solutions across all the egg way processes through housing equipment (Vencomatic, Van Gent), egg handling (Prinzen), and climate control (Agro Supply).



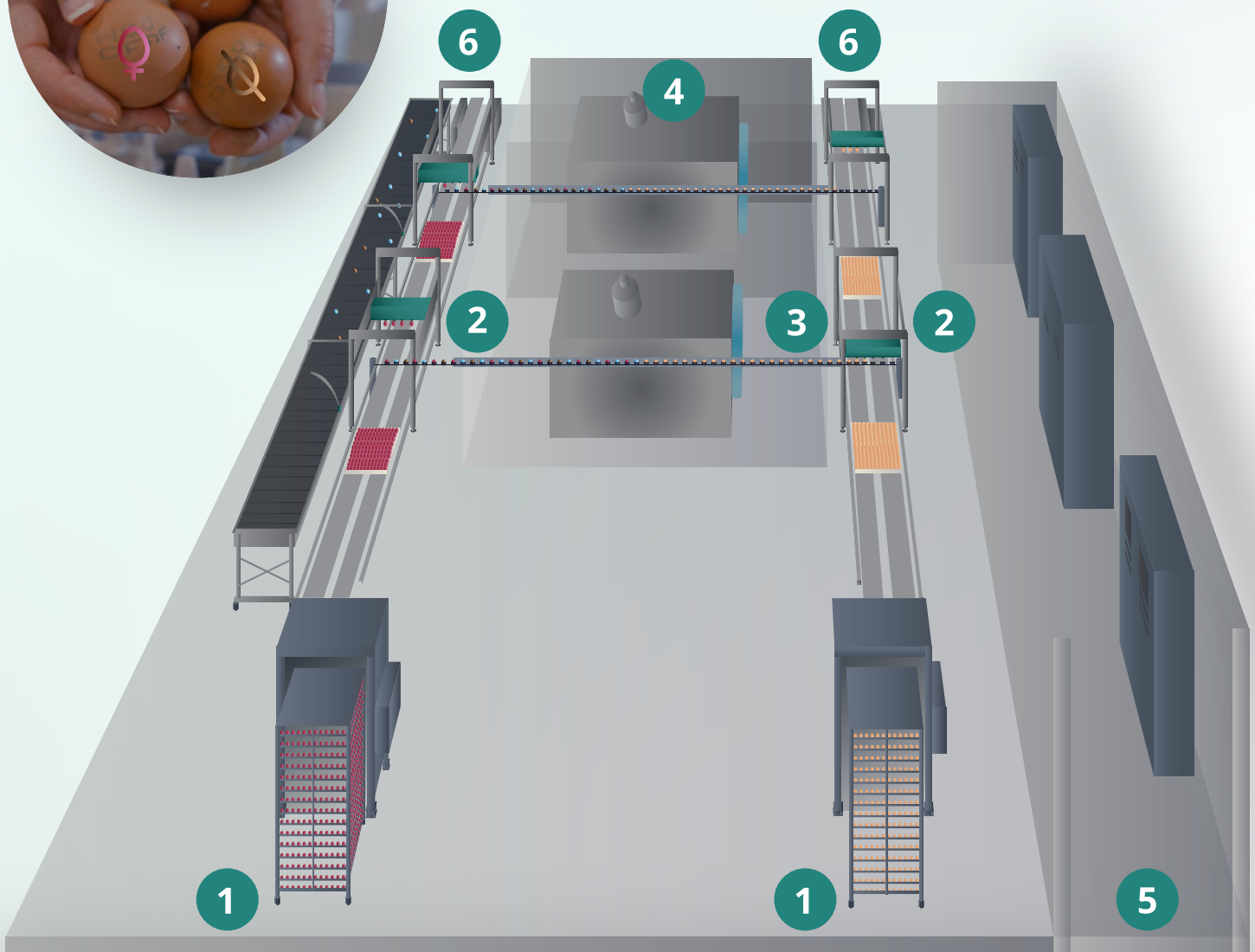
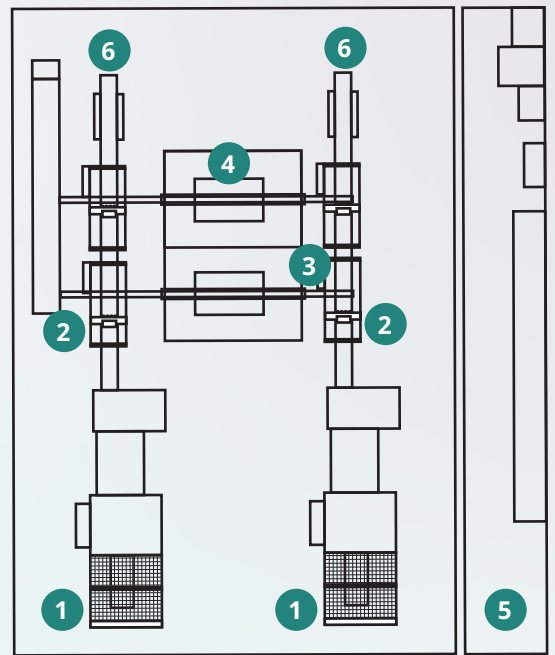
Why the Genus Focus

- Non-invasive and non-extractive scanning on day 12 of incubation and before
- Classifies eggs into female, male, and clear
- No impact on hatchability
- Modular design, up to 8 modules with a total output of 24,000 eggs/hour
- Fully automated from trolley-to-trolley, thus only requiring one operator
- For all types of eggs independent of color, breed, and flock age
- Enabling on-farm hatching for layer farms



The next step in hatchery automation

The Genus Focus for in-ovo sexing provides contactless and biosecure egg classification and sorting into females, males, and clear. With an error rate of less than 2%, hatcheries may avoid male chick culling, generate new revenue streams by selling undesirable eggs, and improve productivity by filling their incubators with female eggs only. The solution is modular in design and can be expanded and scaled as the hatchery production grows. The Genus Focus sexes eggs on day 12 of incubation or earlier, works for all poultry eggs, regardless of the egg size, breed, or flock age.





1 Trolley loader (inbound/outbound)

Used for automatic loading and unloading of setter trolleys. The Genus Focus for in-ovo sexing has two trolley loaders. At the inbound line, a trolley unloader places the trays on the inbound conveyor belt. At the outbound line, a trolley loader moves the trays of sexed eggs from the outbound conveyor belt to the trolley. The trolley loader is available for a variety of setter trays and in a variety of configurations. The machine is made of stainless steel and requires minimal maintenance.



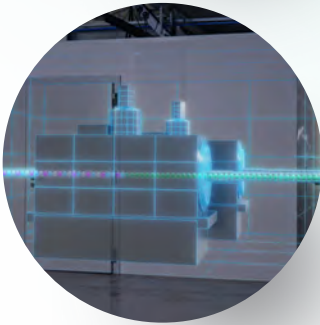
2 Egg transfer system

The Genus Focus has two egg transfer systems. One moves the eggs at the inbound side from tray to the single-line egg chain. The second one collects already-sexed female eggs and places them on trays at the outbound conveyor belt. The egg transfer system employs silicone vacuum lifters which ensure the most gentle egg handling. The unit handles all commercially available setter tray carrying different numbers of eggs in various tray patterns.



3 Single-line egg chain

The egg chain or single-line transport system guides the eggs in and out of the MRI scanning process. It consists of egg cups clipped to a timing belt. The single-line egg chain is a circular chain that after receiving the eggs from the egg transfer system, will pass through the MRI scanner, and then deliver the eggs to the second egg transfer system. The egg chain will pass below the magnet to go back to its initial point and restart the process. For protection, a tube structure envelops the single-line transport system while it goes through the magnet room. This ensures that the eggs do not contaminate the electronics.



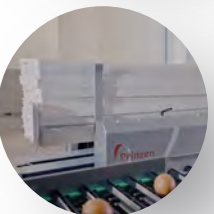
4 Magnet room

The magnet room contains the MRI scanner and is only accessible to trained employees. Acoustic damping of the walls assures that the sound emitted outside of the magnet room is less than 70 dBA. As a result, the solution is silent and user-friendly.



5 Technical room

Control electronics are located less than 10 meters away from the system, inside the technical room. The previous consists of electronic cabinets, workstations, and cooling. To prevent temperature fluctuations, the technical room is air-conditioned. This room does not have contact with the eggs.



6 Empty tray stacker

After the egg transfer system has removed the eggs from the tray, empty trays proceed to the empty tray stacker. This supplementary equipment stacks setter trays and then releases them for transport. The stack goes automatically to the conveyor's end, where it can be manually removed. The maximum stack height is simply adjustable. It also identifies and separates trays containing a trapped egg from the stack. The empty tray stacker saves time and is appropriate for different types of trays.



Frequently asked questions

Does the technology affect embryo development?

No, magnetic resonance imaging (MRI) is a safe imaging technology. Unlike X-ray or CT, it does not emit ionizing radiation and does not affect embryo development. There was no effect on female hatchability to be seen since the start of operation in January 2023.

How many operators do you need and what is their required level of training?

One operator is required for the operation and cleaning of the eight module system. They need to handle the automation equipment on a daily basis and receive a one-week training for using the entire system, including automation, Genus Focus MRI and IT equipment.

Does your solution pose a risk hazard for your operators?

MRI works using a magnetic field that is clearly marked and contained in a separated room (magnet room). Going inside the room requires training so that operators are aware of the necessary safety measures. In normal operations the room containing the magnetic field is not accessed and operators are not exposed to any strong magnetic fields.

Can your system handle any kind of setter tray?

Yes, the modular design and end-to-end automated solution can work with all setter trays available in the market.

General installation requirements

Our project team will be on your side, guiding you through the site and installation requirements.

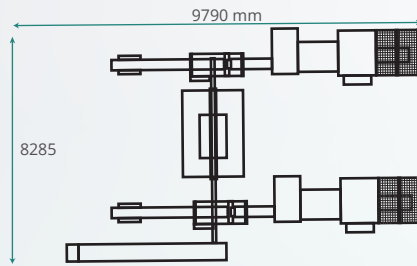
- Have a suitable floor for construction with: even floor, adequate load-bearing capacity and load distribution, and allows drilling into the floor
- The room height is at least 3.0m
- Air conditioning
- Free passage of 2.5m x 2.5m (wxh) without steps for transport of equipment to the installation rooms
- Air cooling for magnet and technical room
- Water cooling to dissipate 12 kW per Genus Focus module.
- Connections to data (LAN) and electricity
- AC power connections 3 phase, 400 V, 50 Hz with suitable distribution boxes
- Pneumatic air connections for the automation equipment

The optimal module number for your hatchery

1 module

Suggested for an annual production of 1 - 3.5 Million female chicks

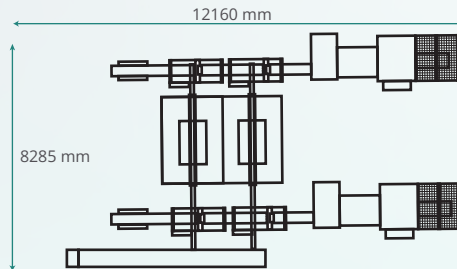
Per hour	3,000 eggs
Per week	120,000 eggs
Per year*	6,000,000 eggs



2 modules

Suggested for an annual production of 3 - 7 Million female chicks

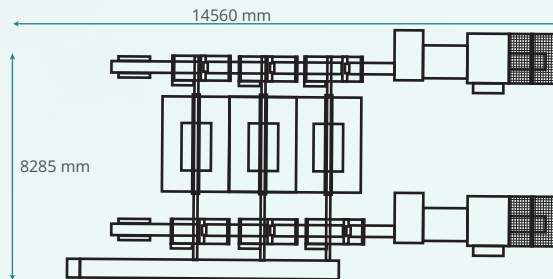
Per hour	6,000 eggs
Per week	240,000 eggs
Per year*	12,000,000 eggs



3 modules

Suggested for an annual production of 5 - 9 Million female chicks

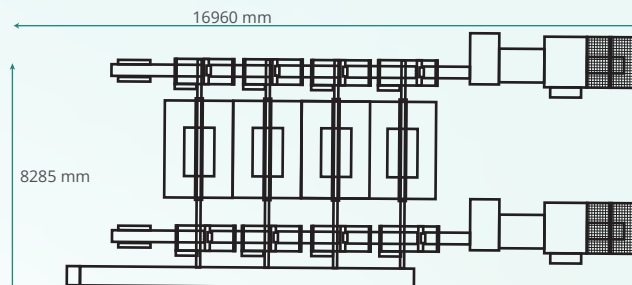
Per hour	9,000 eggs
Per week	360,000 eggs
Per year*	18,000,000 eggs



4 modules

Suggested for an annual production of 8 - 13 Million female chicks

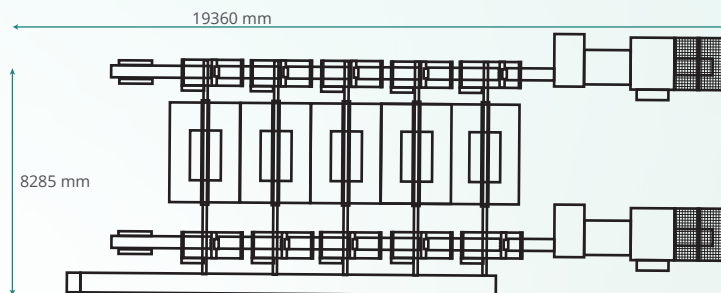
Per hour	12,000 eggs
Per week	480,000 eggs
Per year*	24,000,000 eggs



5 modules

Suggested for an annual production of 12 - 17 Million female chicks

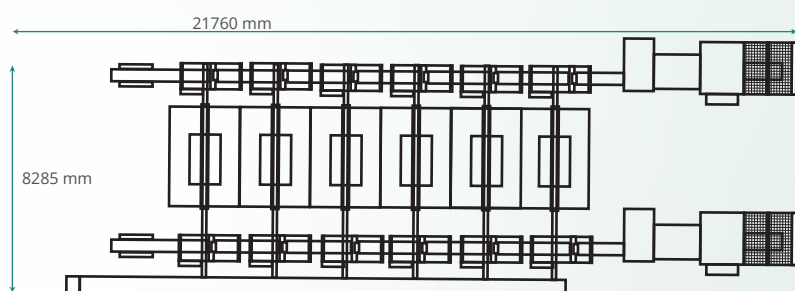
Per hour	15,000 eggs
Per week	600,000 eggs
Per year*	30,000,000 eggs



6 modules

Suggested for an annual production of 16 - 22 Million female chicks

Per hour	18,000 eggs
Per week	720,000 eggs
Per year*	36,000,000 eggs

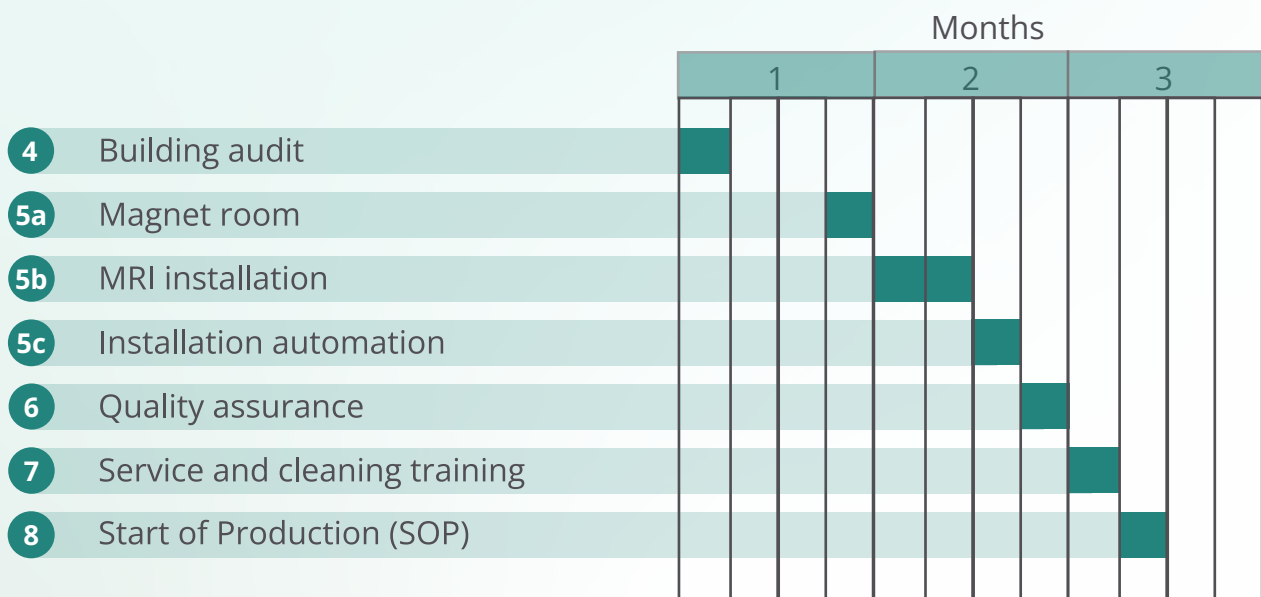


*Scanning 8 hours a day, 5 days a week, 50 weeks a year.

Installation process

From site readiness, it takes less than 3 months to achieve start of production (SOP).

- 1 A project team is formed between Orbem, the Vencomatic Group and the hatchery employees to start the site and installation planning
- 2 During a site visit, the project team inspects the installation site at the hatchery and discusses the site requirements
- 3 Orbem creates an installation timeline, an integrated floorplan and a site requirement checklist tailored to your hatchery
- 4 The project team meets on site to assess the site readiness utilising the site readiness checklist
- 5 The magnet room, MRI equipment and automation equipment gets installed once the site readiness is given
- 6 End-to-end testing is conducted for quality assurance
- 7 Hatchery staff gets trained on operations and maintenance of the Genus Focus. As standard equipment is used, the training takes only 1 - 2 days.
- 8 The Genus Focus gets commissioned and is ready for commercial use.






Genus Focus for in-ovo sexing

The next step in hatchery automation

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Want to learn more?



Watch the video of
our in-ovo sexing
solution