

ALSTOM INSPECTION ROBOTICS

Innovative inspection technology for large-scale facilities



Inspection robots provide precise analyses and improve safety for people and the environment.

Alstom Inspection Robotics is a joint venture of ALSTOM (Switzerland) Ltd and the ETH Zurich. Founded in 2006, the spin-off company develops autonomous inspection robots for power plants as well as chemical and petrochemical installations.

It is of great importance that the availability of large-scale facilities such as power plants, refineries, chemical resp. petrochemical installations, or facilities for accessing, extracting and transporting oil and gas should be as seamless as possible. The operators of these facilities do their utmost to prevent unscheduled downtimes, as these cause losses amounting to millions – every day.

Scheduled downtimes occur in the context of maintenance work and should be kept as brief as possible. They must be conducted on schedule in a reliable and well-timed manner. In order to estimate the point in time for maintenance work, specialists carefully assess whether and when central components must be replaced or repaired. Should a problem occur all the same, the operator and the system supplier must be able to quickly form an idea of what is happening inside the installation. This is a precondition for appropriate repair measures. However, due to ambient conditions such as high temperatures or gases, affected components often only become accessible after a few days.

Shorter servicing times

Until now, many of these analysis and inspection activities were carried out by specialists – i.e. by people. This meant that large elements such as turbines had to be painstakingly dismantled into their component parts to give technicians access to affected elements. Thanks to major technological advances in robotics and measurement technology, especially as regards non-destructive testing, it will now be possible to have numerous service operations performed by so-called inspection robots, making it unnecessary for specialists to disassemble installations or parts thereof in complex, time-consuming procedures.

Inspection robots «crawl» into installations

Inspection robots are small systems which can be introduced into machines or pipes; they are then able to navigate independently, carry out automated measurements where required and transmit results to specialists. Inspection robots have numerous further advantages: they are capable of independently performing simple cleaning and maintenance tasks. Due

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to their small size, they can carry out material analyses in areas of installations or machines which are practically inaccessible to human inspectors. Last but not least, they are less sensitive to heat and gases, meaning results are available more promptly after an installation has been shut down.

Vision: combining innovation and industrial robustness

Alstom Inspection Robotics develops inspection robots for large-scale facilities in the field of power generation and industrial processing. These devices increase the availability of facilities thanks to shorter servicing intervals, and improve safety for people and the environment. Alstom Inspection Robotics' products are characterised by innovation, everyday reliability and a robustness appropriate for industrial conditions.

Products and competences

Alstom Inspection Robotics' products are based on a modular system of robotics elements which are combined into autonomous inspection robots tailor-made for each customer. Alstom experts who assemble each of these intelligent systems according to the individual requirements of facility operators have specialist and broad know-how of the integration of mechanics, electronics, software and measurement data processing. Core competences include:

Precision mechanics with a focus on

- propulsion technology and kinematic mechanisms (steering, overcoming of obstacles etc.)
- robustness and reliability, minimal space requirements and optimal manoeuvrability
- protection from external factors (dust, dirt, liquids, gases)

Mechatronics/electronics with a focus on

- engine control
- integrated navigation systems (sensors and navigation algorithms)
- integration of measurement data collection and processing
- systems integration (video, water jet cleaning etc.)

The team

Under the stewardship of CEO Ekkehard Zwicker and CTO Wolfgang Zesch, Alstom Inspection Robotics' closely knit interdisciplinary teams bring together engineers and technicians of different nationalities from the field of mechanics, mechatronics and electronics. Logistics and quality experts ensure availability and quality.

Alstom Inspection Robotics carries out its development, production and testing activities in close collaboration with experts of its industrial partner Alstom Switzerland.

Close collaboration with leading research institutes

Leading Swiss research institutions such as the Federal Institutes of Technology Zurich and Lausanne, as well as Alstom's R&D department, are closely involved in product development. This collaboration allows Alstom Inspection Robotics to implement cutting-edge technological innovations into tried-and-tested products suitable for industry.



Rotor inspection using state-of-the-art technology by Alstom Inspections Robotics.

The location

The Technopark Zurich – a site for young, technology-focussed companies – offers Alstom Inspections Robotics an ideal work environment. The ETH Zurich is quickly reached by public transport; so is Alstom's site in Baden, only a 20-minute interurban train ride away. Zurich's Kloten airport is also easily accessible, allowing Inspection Robotics' employees to promptly reach users on their premises.