Good news for plant and animal breeders and molecular biologists in general: with the new oKtopureTM from LGC, the fully-automatic extraction of DNA becomes almost as easy as child’s play. This DNA extraction robot combines high sample throughput numbers with high-quality standardised DNA purification and thus relieves highly-qualified personnel of the need to carry out routine activities. Part of the solution is a handling system based on electric axes, motors and controllers from Festo.
Many breeding programs involve a significant increase in the number of samples, which can be technically challenging for breeders if they are to analyse plants rapidly and precisely. The first step in the selection process consists of purifying the DNA, which needs to be purified for analysis or, in other words, free of contamination.

The oKtopure from LGC was developed to speed up breeding programs and many other molecular biological analyses. The robot allows 8 x 96 Deepwell plates to be purified in parallel, enabling up to 5,000 samples to be extracted in the course of a normal eight-hour working day. The precise throughput depends firstly on the duration of the extraction protocol and secondly also on the starting weight or volume. It also depends to a large extent on the sample material itself (leaf and seed material, animal tissue, hair, etc.).

sbeadex - high-quality DNA preparations

The oKtopure utilises the sbeadex™ extraction chemistry developed by LGC, which is based on the use of magnetic particles. These particles can specifically bind nucleic acids such as DNA and thus allow the separation of DNA from other contaminants. sbeadex is based on a two-stage binding mechanism, so that water can be used for the final washing step. This avoids having to dry the DNA and, in addition, efficiently removes contamination. The resulting highly pure DNA can then be used for all molecular-biological technologies, including sequencing. sbeadex purification also enables KASP™, LGC’s unique SNP genotyping chemistry, to be used.

The oKtopure itself is equipped with a 96-fold pipetting head and eight magnetic blocks. These magnetic blocks bind the magnetic particles at the base of the Deepwell plates, allowing extraction buffers and thus contamination to be removed efficiently.

Individual complete system

The high level of automation is provided by a handling system from Festo, whose experts in the production of pneumatic and electric automation technology adapted this precisely to the requirements of the customer’s laboratory application. The required high precision for the three-dimensional gantry for liquid handling is made possible by the electric toothed belt axes EGC on the X- and Y-axes. The double...
"The fact that Festo was able to offer us a complete package of hardware, software, consultation and services was the key to our decision."

Dr. Dietrich Köster, Product Manager, LGC.

Z-axis EGSK with spindle drive ensures exact positioning of the dispensing head. The three-dimensional gantry for liquid handling from Festo is supplied as a complete system.

The gantry is easy to commission and can also be integrated quickly into machines. The pre-parameterised drive and controller package gives users the security of knowing that they can concentrate on their own core competencies without having to concern themselves with the details of automation technology. "The fact that Festo could offer us a complete package consisting of hardware, software and a consultancy service is what tipped the balance in their favour," explains Dr. Dietrich Köster, Product Manager with LGC.

Concentration on core processes
Festo delivers its ready-to-install system solution fully assembled and tested directly to the test facility. The scope of delivery includes all design data and circuit diagrams and a comprehensive functional guarantee. Under a single part number, users not only receive hardware in the form of a ready-to-install module or subsystem, but a complete added-value package.

Fully-automatic extraction of DNA becomes almost as easy as child's play: thanks to the oKtopureTM from LGC.

About LGC:
LGC is active throughout the world in the life sciences sector as a manufacturer of measurement and testing equipment. It produces system solutions for DNA extraction in its own extraction laboratories and has its own chemical substances for the extraction process. Worldwide, the company's 2,000 staff generated a turnover of 218 million Pounds in the financial year 2013/14.

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Complete solutions ease the burden on technical personnel, keep design costs low, simplify the procurement process and reduce process costs. "We took advantage of the engineering know-how of the Festo automation specialists, which saved a great deal of time throughout the process, especially during testing and commissioning," emphasises Köster.
About Festo:
Festo AG is a global player and an independent family-owned company with headquarters in Esslingen, Germany. The company supplies pneumatic and electric automation technology to 300,000 customers in the fields of factory and process automation in over 200 industry segments. Products and services are available in 176 countries around the world.

The company has around 17,800 employees in 61 national companies worldwide and generated a turnover of some €2.45 billion in 2014. More than 7% of this turnover is invested each year in research and development. 1.5% of this learning company's turnover is invested in basic and further training. However, training services are not only provided for Festo’s own staff – Festo Didactic SE also supplies basic and further training programmes in the field of automation technology for customers, students and trainees.

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