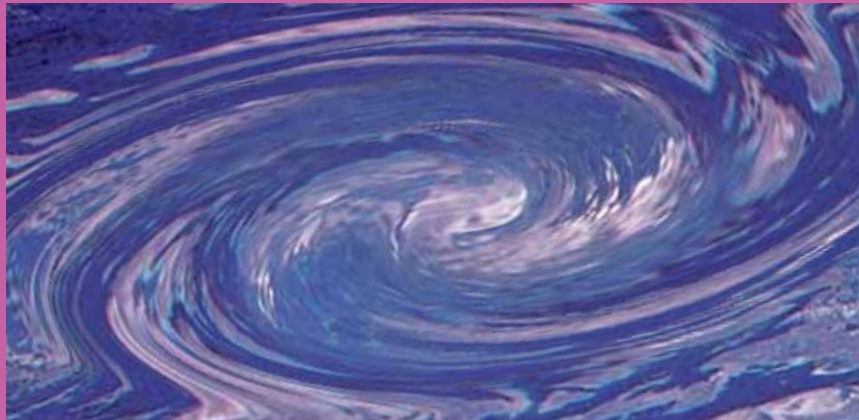


Elabo TestSystems

Quality – without any ifs and buts



WET

Perfect sector-specific solutions for manufacturers of

- washing machines
- tumble dryers
- dishwashers



ELABO - partnership without limits

Elabo TestSystems; sensible and innovative solutions for inspection and test tasks from a single source.

For more than 30 years now, Elabo has been a recognised partner of the industry in addition to the test and certification bodies for dishwashers and laundry care products.

The wealth of experience obtained in this manner allows us to offer you optimum support in every respect during development, production and



and experience from development, electrics/electronics in addition to construction that makes it possible for us to design, develop and above all implement in an economically viable manner sensible test systems for your needs.



quality control ranging to product safety and guaranteeing performance.

Finding perfect solutions for your requirements is a matter of course for us and represents a constant stimulus and daily challenge.

At the same time, you can rely on an efficient team of technicians and engineers from the most diverse specialist areas. It is precisely this combination of know-how



ELABO – safety and functional test systems



A decisive element for you is that your production in a smooth and error-free manner.

Our systems render complete functional and safety testing possible. The clear and efficient control in addition to monitoring of the entire production process guarantees dovetailed integration in existing production data systems.

Different processes require flexible solutions. This is why our systems have a modular structure and can be easily adapted to your requirements. Subprocesses and semi-automatic processes can be realised in this manner.

A central data control requires constant data exchange. Consequently, our test systems can be directly connected to a central server. The necessary device identification is performed via a barcode or RFID systems and test programs can be individually drafted.

The following principle always occupies a forefront position in the development of our systems: finding the optimum solution for your requirements; without losing sight of the essential elements for you.



Your decisive advantages:

- increased and guaranteed product quality.
- minimisation of personnel placement by subprocesses or fully automated processes.
- reduction in production costs by rapid and efficient systems.
- by the shortest cycle times reduction in the number of test systems required
- reproducibility of the results and central data handling by the integrated server.
- execution of the inspection and test installations in accordance with standards.
- increased flexibility by modular design.
- increased production clarity by integration of additional statistical functions.

ELABO – detailed solutions

Perfect operation of an installation often relies on things you cannot see. You can rely on us to pay attention to the smallest detail in constructing a test installation. Since only this guarantees that your production will operate safely, durably and economically.

Finding the optimum solution for you does not always mean that an installation must be completely redeveloped. We implement modular assembly systems which are precisely adapted to your requirements.



This is because controlled adaptation of the devices is indispensable for smooth serial production. On the one hand, there is the requirement to adapt the test pieces with the voltage supply and water and waste water connections; on the other hand,

the necessary sensor technology for the tests must be provided. Our entire wealth of experience is displayed here.

This is because even during the design phase, we pay attention to such “small matters” as user friendliness, ergonomics and accessibility – entirely to your subsequent benefit. Our draftsmen create the basis for this by using the most modern 3D CAD and simulation programs. As a result, even complex testing systems are rapidly realised.



ELABO – auditing test systems



You are obliged to provide the necessary proof of testing at any time. Consequently, 100% functional and safety testing over the entire production chain is required which is supplemented by regular random sample tests. Our test systems assist you in acquiring and maintaining the necessary quality standards.

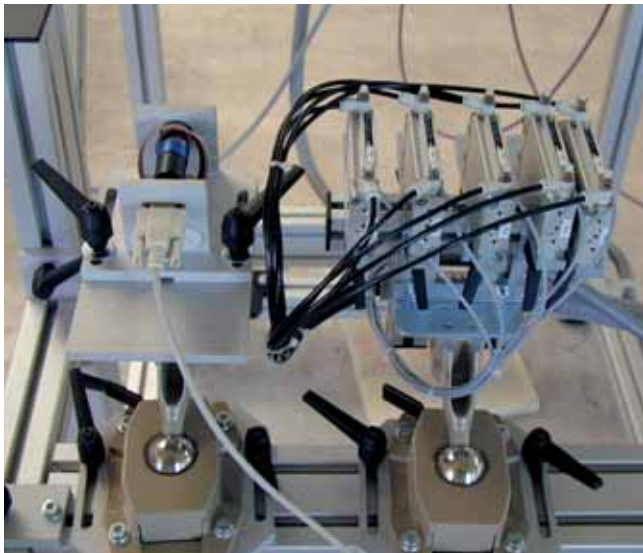
These auditing tests are conducted on a previously firmly defined percentage of the entire production quantity. In order to ensure that a recording is achieved which is as complete as possible, the number of random samples can be deduced from the existing occurrence of errors and the relevant standards.

The devices are tested under realistic conditions during the test procedure. All the necessary test data are recorded, transferred and analysed by means



of special data loggers. The data document compliance with the established quality standards and ensure error-free goods delivery.

In our test installations, special embedded systems, connected via Ethernet to a master computer, control the processes. The master computer establishes the link with the customer's process data control.

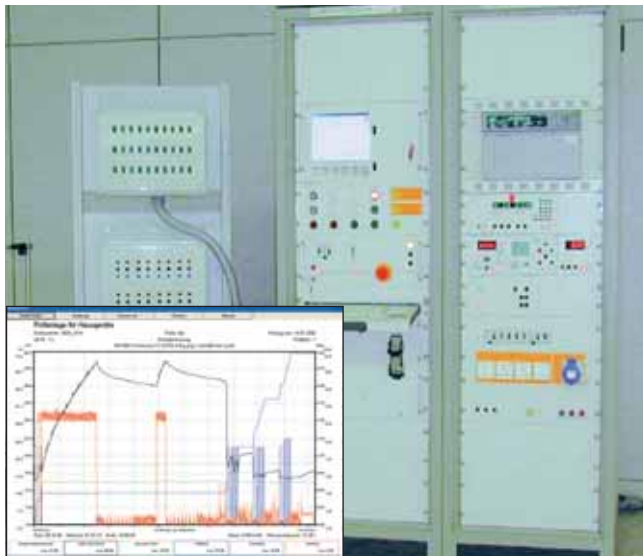


geprüfte
Sicherheit

ELABO – energy efficiency measurement / winding temperature rise

Large appliances such as washing machines, dryers or dishwashers in private households number among the largest energy consumers. Their energy efficiency documentation is therefore an important purchasing criterion.

As early as more than 10 years ago, ELABO developed systems in conjunction with the VDE test institute which form the basis for recording, documentation and comparability of the energy consumption of individual appliances in accordance with standards.

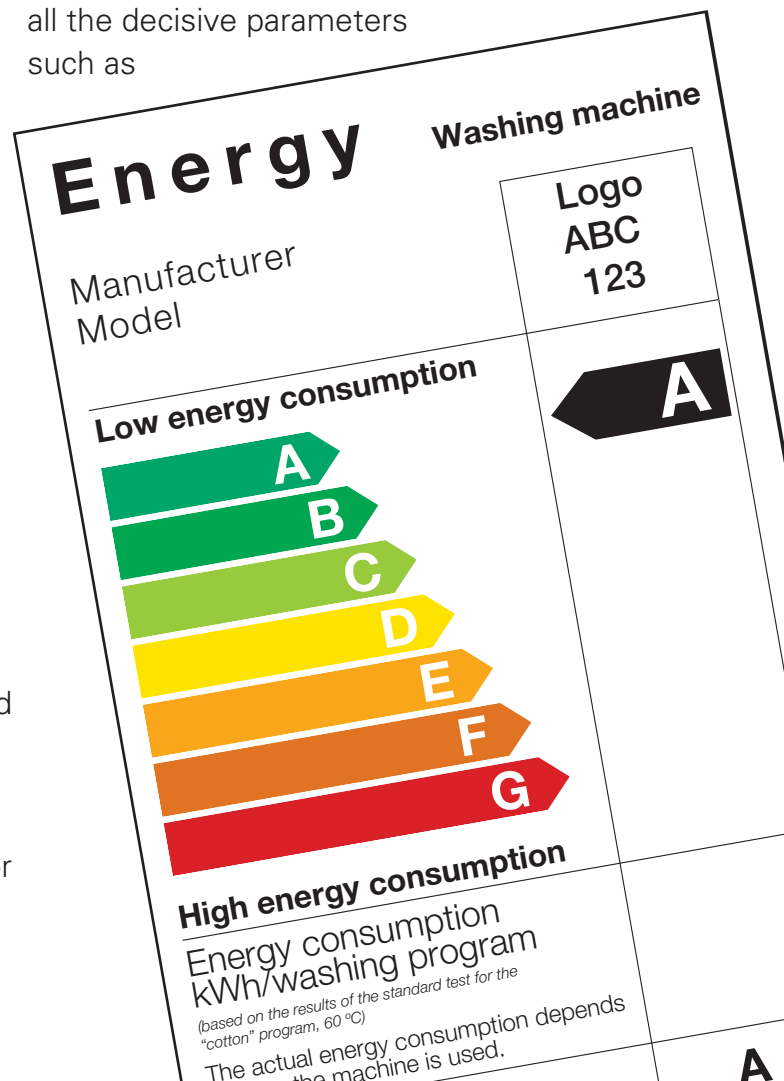


voltages, currents, outputs, energies, temperatures, rpm and direction of rotation, water consumption and water pressures can be acquired, recorded and analysed in concrete figures.

Furthermore, our test systems can also be equipped for recording the leakage current and winding temperature rise.

Our many years of experience have made us what our customers appreciate; the partner for solving your test problems.

We are not resting on our laurels. This is why we have constantly further developed our appliances. We can offer you modular systems in order to comply with all the existing requirements. In doing so, all the decisive parameters such as



ELABO – systematic flexibility



Safety tests are required at the various different stages within the manufacturing process and it must be possible to perform them at the most diverse points within the manufacturing process if necessary. Consequently, the requirements for the test device are highly varied.

In order to enable you to optimally fulfil these requirements, we have developed a modular assembly system composed of hardware and software elements that can be flexibly deployed. You therefore only need one test

device to accomplish all existing tasks. This is an important economic advantage for you.

Our test devices are not only characterised by their flexible versatility, but also by the high process speed and compact design.



Safety and handling advantages which are perceptible in daily use.

Our basic devices cover all the essential safety testing types according to EN, IEC or UL standards. Furthermore, the range of use can be easily extended by corresponding additional modules.



ELABO – production systems for control panels



We offer solutions down to the last detail. This also includes the design and realisation of matching assembly, programming and test system solutions for your device controls.



Ergonomic aspects occupy a forefront position in the development of your assembly stations. Since it is only in this manner that a rational material flow can be designed, which avoids e. g. unnecessary displacements and superfluous movements.

We therefore do not merely restrict ourselves to the actual assembly station. Instead,

we also offer you sensible solutions for material availability and transport to further production/assembly stages in addition to partly and fully automatic assembly devices.

We also produce computer-aided information systems in order to simplify and accelerate the working process.

We guarantee safety in production and rapid cycle times by identification systems integrated in the goods conveyor, which avoid misallocations and waiting times within the assembly process.



ELABO – turnkey solutions from a single supplier

In order to offer you the greatest possible economic success, we design and manufacture complete programming and test systems.

Programming cells, which are fully automatically supplied with the files JUST IN TIME via the data server and test cells which include both the visual characteristics (e.g. printing, display function) and the mechanical functions (pushbuttons, rotary selector switches, inputs/outputs). If device errors are detected, automatic



channelling to the repair area occurs, where appropriate diagnosis systems allow rapid repair and return to the production process, thereby guaranteeing 100 % tested quality. Once labelling has been completed, the devices are transferred to the withdrawal and packaging stations.

The constant, up-to-date overview of the entire production process is made possible by the connection with the merchandise information system.

Our systems are designed in such a way that each test process can also be performed individually. In order to take full advantage of existing potentials for cost optimisation, it may be meaningful for example to relocate programming directly to the assembly line
– ONLINE.

Programming on the finished device represents the highest integration stage
– INLINE.



ELABO – software solutions

Our ability and knowledge is not merely restricted to development and realisation of optimum test installations. The appropriate software solutions considerably contribute to guaranteeing the optimum test process.

Our software solutions guarantee you compliance with the established test schedules and recording of the measurement results achieved. The necessary test protocols and statistical analyses can of course be generated at any time.

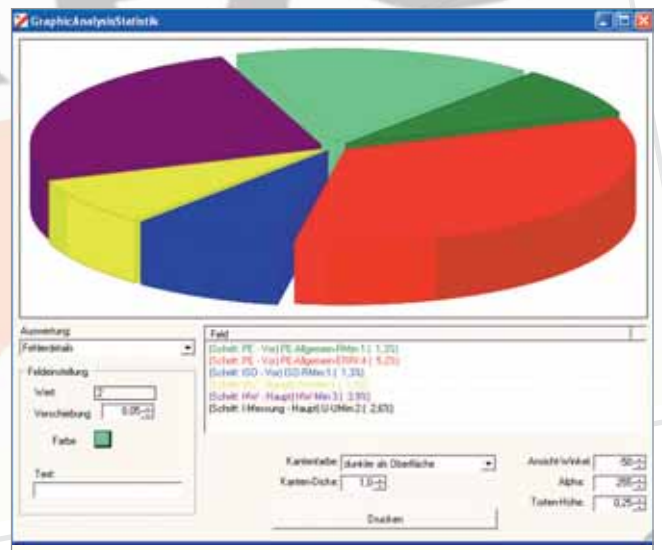


The starting point is the ELABO standard software package which can be extended along modular lines and is constantly being further developed.

It is important for us to be the competent partner for you. That is why we use modern tools such as NET Framework, C#, C++, LabView and Visual Basic in addition to comprehensive and high-performance graphic processing modules.

A decisive advantage for you: our solutions are integrable in existing networks and EDP structures by means of appropriate interfaces. This avoids undesirable "island solutions".

Connections have already been performed with: SAP R3, Navision, Microsoft SQL server, FTP databases and Oracle.



ELABO – the system provider



All devices are not only suitable for use as components in test systems. Instead, they are designed in such a way that they can also be used as individual devices for manual testing. Simply ask for our **test device** catalogue, where you can obtain an overview of our entire range of services.

We consider that we offer a service – and we have something to offer you. We can therefore for example set up complete workstations for you in the development department, quality assurance, goods

reception control or in laboratories. Our product groups **ELABO Laboratory Systems** and **ELABO Electronics** show you the right solutions. As a producing company, it is important for you that the entire production process functions rationally and economically.



Our **ELABO-TaMo** sector offers optimum solutions for provision, transport and intermediate storage. Manual and partly automatic assembly is necessary in cases in which other alternatives are not economically meaningful. **ELABO-TaMas** provides you with all the necessary workstations, with a modular structure, simple to adapt and easily extendable if necessary.

**ELABO TestSystems –
professional solutions
in many other fields.
Ask us!**

Cooking, baking



Refrigerating



Electric power tools



Components



Power supply units



Converters



ELABO GmbH
A company of the euromicron group
Rossfelder Str. 56
D – 74564 Crailsheim
Tel.: +49 (0)7951-307-0
Fax: +49 (0)7951-307-66
info@elabo.com
www.elabo.com
www.elabo-testsysteme.com