

STRONG IN EVERY RESPECT WITH ASSEMBLY AND TESTING TECHNOLOGY

MOVING THE LIMITS.
TOGETHER.
CONSTANTLY.

ASSEMBLY & TESTING AS AN INTEGRATED PROCESS

We belong to the 10 leading special machine builders in Germany. Assembly and testing technology is our specialty.

We have developed our technology, system and process knowhow over decades and in numerous sophisticated projects. On this basis, even the most complex tasks and

requirements are implemented by us – from manual to semi-automatic work systems up to highly automated complete solutions with integrated testing technology.

CUSTOMIZED

Our systems are designed for maximum performance and for cycle times being perfectly adaptable to your processes. Whichever strategy you are pursuing: You will be fascinated by the high availability of our systems.

LEAN PRODUCTION

We undertake the planning, design and layout for the entire process chain. Including the combination of all stations and an optimized material flow. With very convincing results: Highest output, greatest flexibility, maximum availability and minimum space required due to a perfect equipment layout.

INDUSTRIE 4.0

All operating, machine and process data are recorded and evaluated by means of the integrated MES system. As a result, the subsequent processes can be optimally controlled and adjusted. An intelligent parts flow is implemented. Quality is continuously measured in the running processes. Adjustment of parts quality occurs in real time, which means before any scrap is produced. Permanent recording of the machine status also provides the data for a predictive maintenance.

No limits in process technology

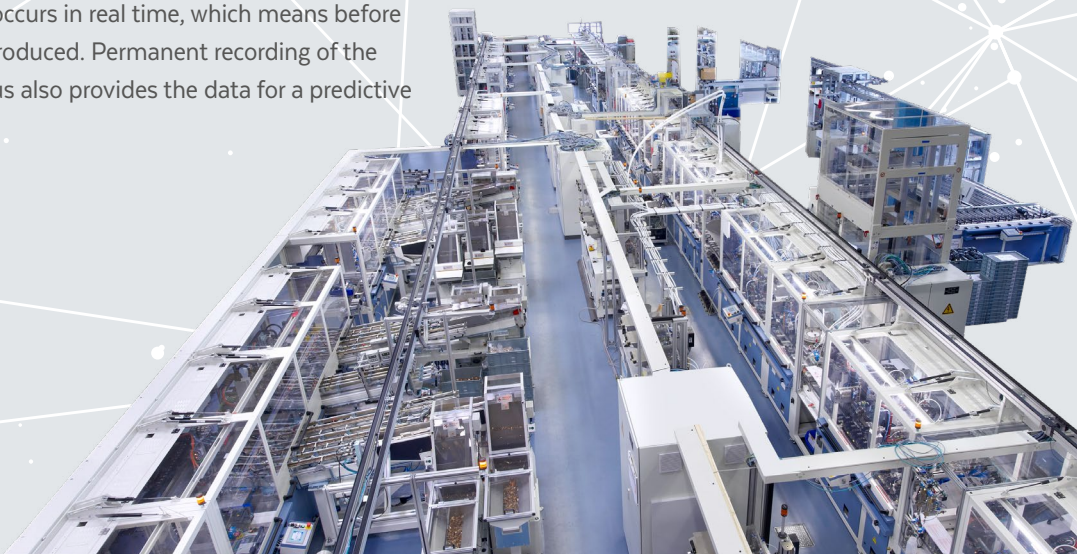
Our assembly and testing systems allow very different processes to be implemented and combined with one another.

Connection technology: e.g. Laser welding • Friction welding • Ultrasonic welding • Mirror welding • Resistance welding • Inert gas shielded welding • Clinching • Rolling & Reeling • Riveting & Crimping • Joining & Pressing • Inductive soldering • Bolting • Plastic extrusion coating • Gluing • Punch riveting • Hot gas stamping

Dosing technology: e.g. Greases • Oils • Adhesives • Sealing compounds

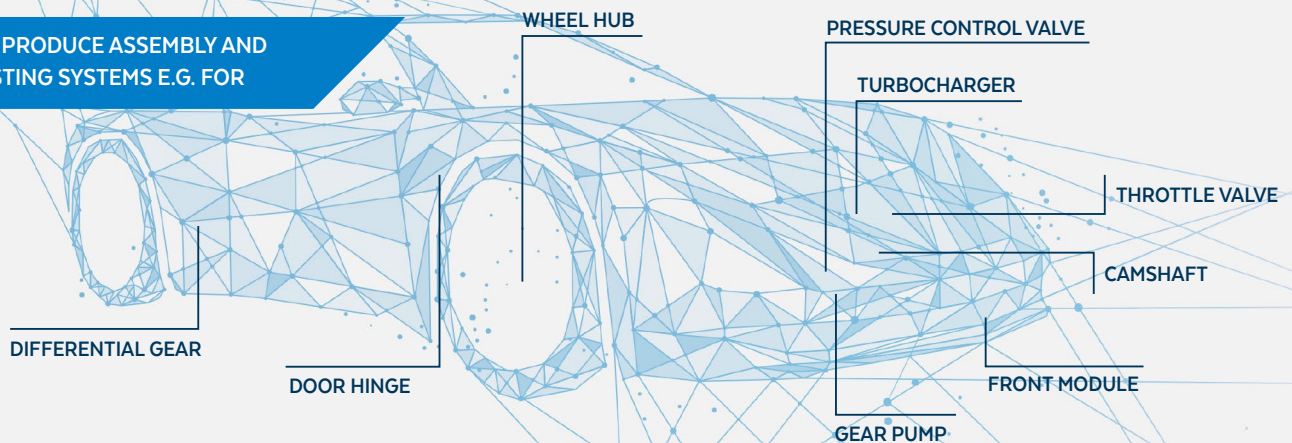
Testing technology: e.g. Light • Pressure • Force • Distance • Acceleration • Torques • Weight • Sound • Magnetism • Voltage • Current • Resistance • Leak tightness • Flow • Flow rate • Volume • Temperature • Optical

Marking: e.g. Laser marking • Labeling • Scribe marking • Needle embossing • Inkjet printing • Hot stamping • Etching • Pad printing



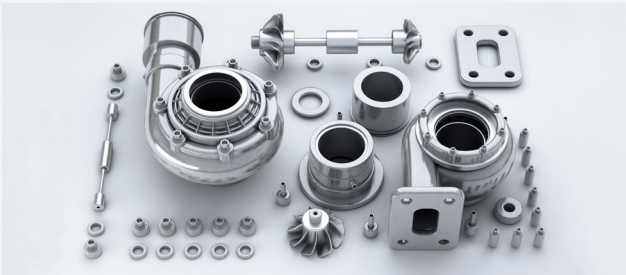
MODERN PARTS PRODUCTION IN AUTOMOTIVE MANUFACTURING

WE PRODUCE ASSEMBLY AND TESTING SYSTEMS E.G. FOR



The automotive industry and its suppliers rely on our highly efficient and precise assembly solutions.

APPLICATION EXAMPLES & REFERENCES



Assembly and testing lines for turbochargers

Our turbocharger assembly lines impress with a high product quality at specific line performance and maximum availability. The setup kits for a rapid process changeover are automatically identified by the control system.



Assembly and testing lines for camshafts

In this assembly line adjustable cam bushings are mounted onto the camshafts. Across the entire variant diversity a total of more than 70 components are processed to order – without setup losses during a changeover. Afterwards the camshafts are subject to a quality inspection in measuring stations.

EFFICIENCY BY STANDARD MODULES

Optimum production conditions as well as time and cost savings ensure the success of your business. Our machine platform help you to achieve it.

ProMoCell® is our machine platform for all of your production, assembly and test processes. It grows flexibly with its tasks, is quickly available, robust and yet mobile, thus helping to save time and costs. Moreover, its serviceability and a very effective safety at work, ESD and fire protection are convincing. ProMoCell is available as table version (TSX) and as floor-mounted version (FSX).



FUTURE MARKET SENSORS

Autonomous driving will revolutionize the road traffic – and increase the number of sensor systems needed. No problem for our customers. They are optimally prepared for the future with our flexible solutions.

Our assembly lines for high-quality sensors and control units will give you the competitive edge through scalability as needed and high diversification.

Sensoren:

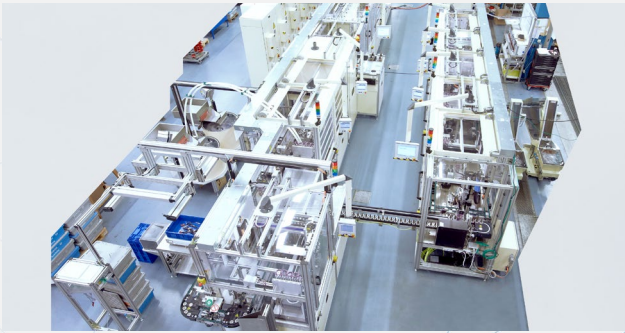
- Radar sensors
- Ultrasonic sensor
- SVC (Surround View Camera)
- MPC (Multi-Purpose Camera)

- Acceleration sensors
- Planar sensors
- Lambda sensors (exhaust gas sensors)
- Low pressure sensors
- Medium pressure sensors
- High pressure sensors

Steuergeräte:

- ABS
- EPS
- Gearboxes
- E-drives
- Inverters for E-motors

APPLICATION EXAMPLES & REFERENCES



Assembly and testing line for lambda sensors

Automatic assembly and testing line with pre- and final assembly connected via a buffer conveyor. With automatic setup and parts feeding (single-type), semi-automatic carrying out of measuring and test routines as well as full-automatic final test.



Test station for ABS and ESP control units

For the automated function check to 100 %. Loading and unloading of the test locations by means of robot. Monitoring of the component type and activation of the test program by DMC-code scanner. Set-up without interruption.

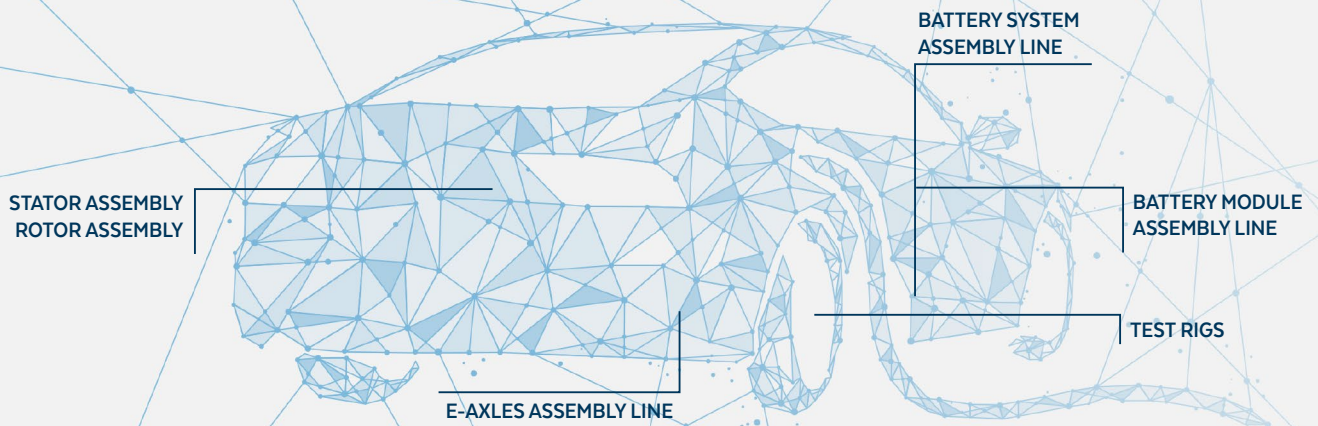
Testable physical parameters:

- Flow rate
- Temperature
- Acceleration
- Resistance
- Torques
- Magnetism
- Voltage
- Weight
- Force
- Distance
- Leak tight-ness
- Flow
- Current
- Volume
- Sound
- Pressure
- Optical

Integrable Processes:

- Plastic extrusion coating
- Hot gas stamping
- Gluing
- Resistance welding
- Ultrasonic welding
- Friction welding
- Laser welding
- Inductive soldering
- Bolting
- Riveting & Crimping
- Joining & Pressing
- Dosing
- Marking

CHALLENGE E-MOBILITY



E-mobility is booming. Time-to-Market is the decisive competitive factor. However, nobody can predict the trends and quantities required. Is it advisable to invest in maximum production capacities? We have a better idea.

We recommend solutions which start small and are scalable to suit the requirements. For example, assembly lines for battery modules, battery systems, rotors, stators and e-axes which are adaptable to many different call-off scenarios. Without downtime the production capacity can be gradually extended.

The quality of the components produced on these assembly lines can only be measured reliably with absolutely sophisticated test rigs. We also have these in our product range. In addition to test rigs for gearboxes and battery systems we also supply EoL test rigs for complete e-motors and e-axes as well as customized solutions.

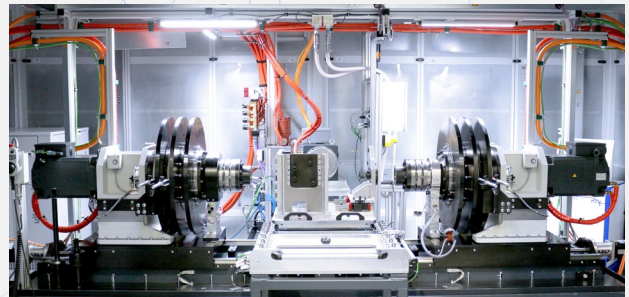
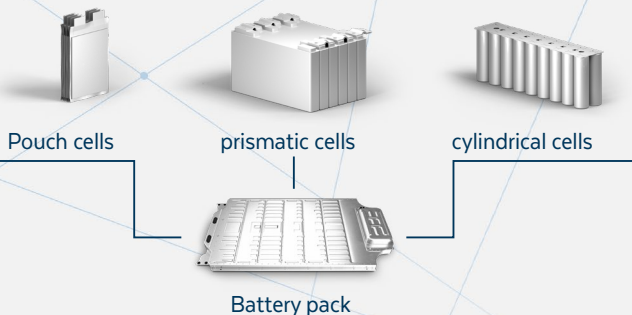
APPLICATION EXAMPLES & REFERENCES



Battery system assembly line

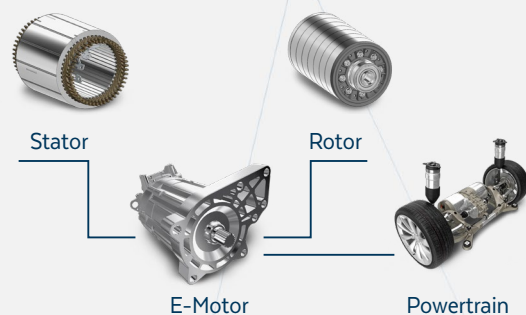
KA compactly designed line with all process steps provides the basis. Technology cells and modules are added and ensure a scalable production along the entire value chain by means of expansion or consolidation. Also the processes can be very flexibly changed.

Possible cell formats:



EoL test rig

The EoL test rig was designed specifically for testing of electric motors and electric axes, and can be used both in development and automatic assembly processes. Different measuring systems allow a wide range of qualified electrical and mechanical tests.

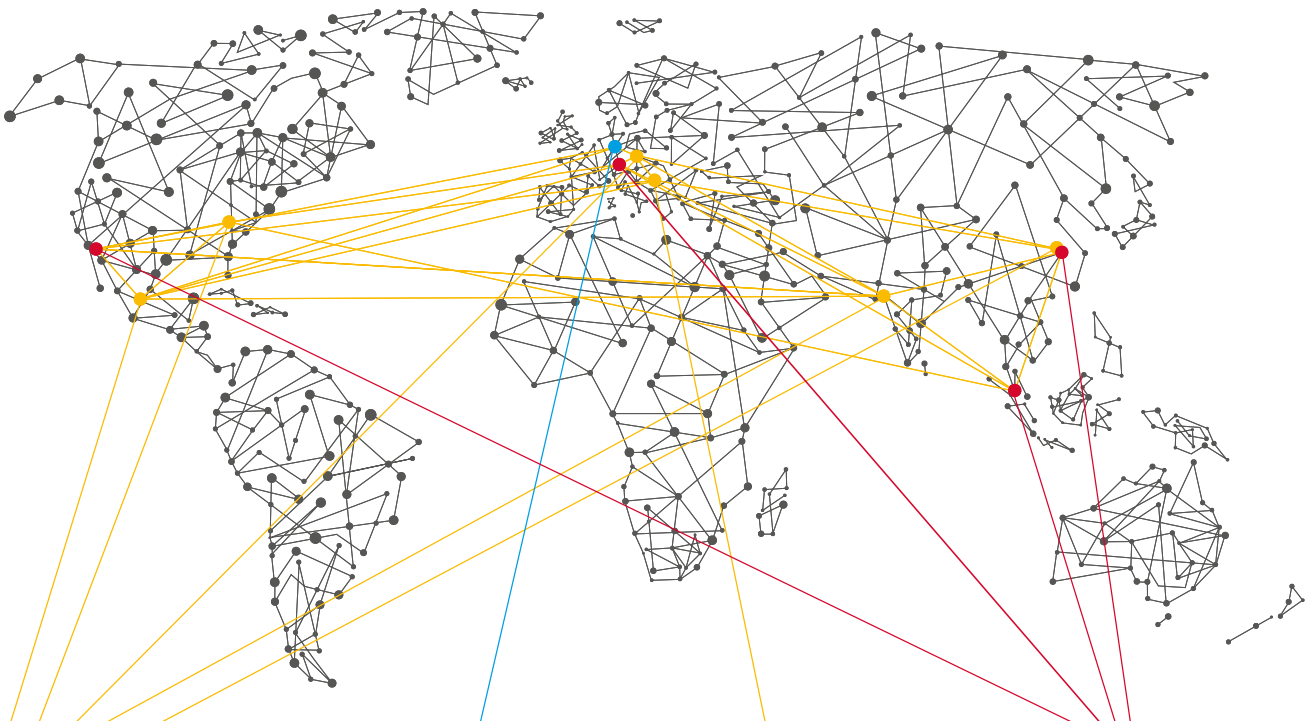


POWERFUL SYNERGIES: “MEMBER OF STRAMA GROUP”

Strama-MPS develops special-purpose machinery, equipment and complete solutions for the production, assembly and testing of complex technical components and products. International technology groups appreciate our engineering expertise, the experience and the certainty: We lead your project to success.

AuE Kassel has acquired in recent years an excellent reputation with assembly lines for axles and chassis components in the passenger car and commercial vehicle sector. With its axle alignment systems AuE has long been the world market leader.

For more than 40 years, **F & K DELVOTEC** is the worldwide innovation leader for wire and laser bonders. Renowned companies and research institutes worldwide are convinced by the quality of the technology and engineering services.



GERMANY, Straubing
CHINA, Taicang
USA, Duncan
MEXICO, Puebla
INDIA, Nashik



GERMANY, Kassel



CROATIA, Cerna



GERMANY, Ottobrunn
USA, Foothill Ranch
CHINA, Taicang
SINGAPORE

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