

Electromobility: Electrification of the powertrain

FESTO



Electrification in the automotive industry is gathering pace and redefining mobility. The use of energy-efficient drive solutions is opening up more and more opportunities for future-oriented, green and economical vehicle concepts. We look forward to helping you set your innovations in motion with appropriate solutions for the entire powertrain.

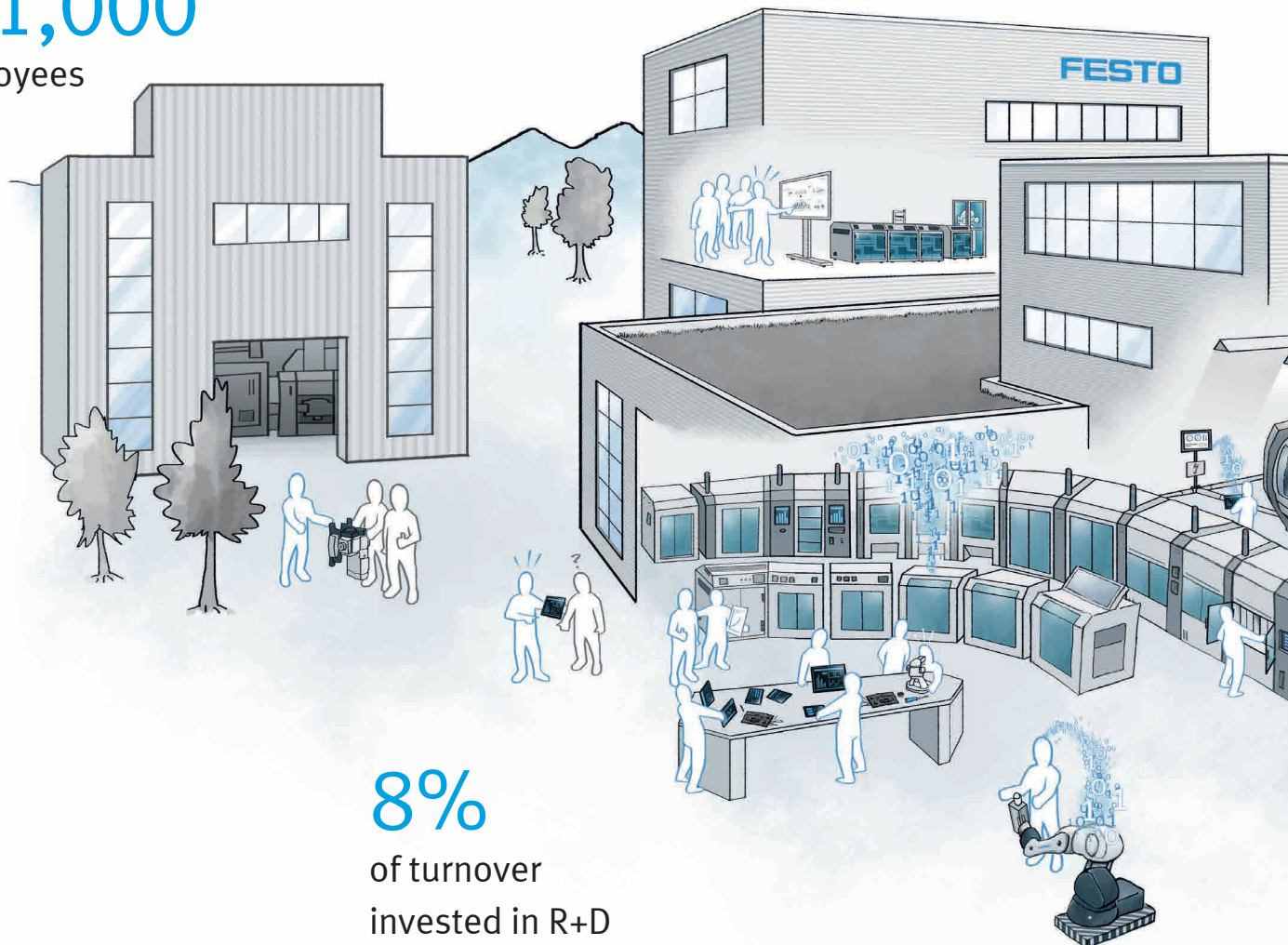
Festo as your partner. For today and tomorrow

The automotive industry is undergoing transformation. The future is electric. Established processes, structures and value and supply chains are changing.

The new strategic and technical direction of drive and vehicle concepts increasingly requires both flexible as well as intelligent and energy-efficient production technologies.

>21,000
employees

>3.07 billion EUR
turnover



8%
of turnover
invested in R+D

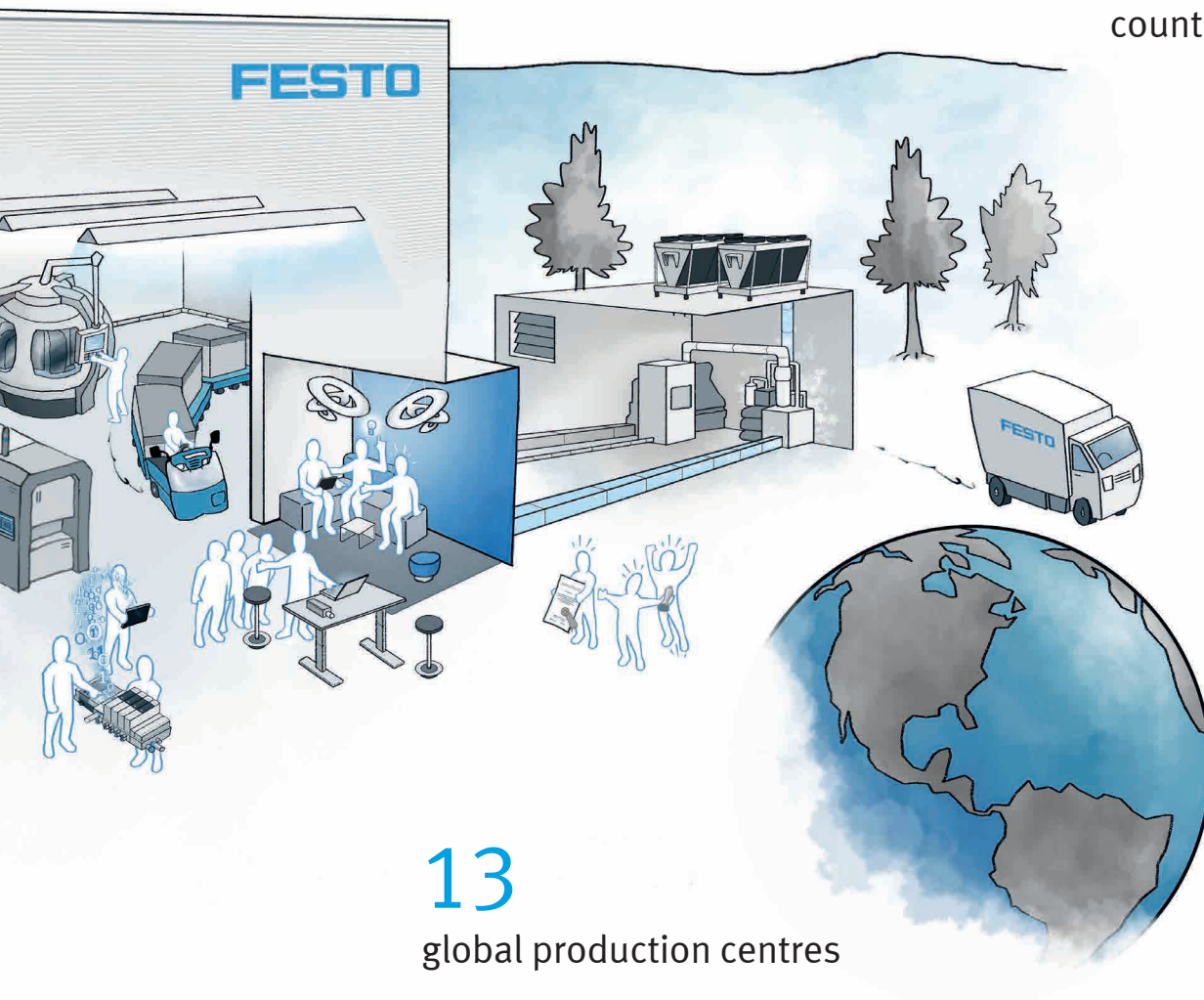
>300,000
customers

Join us in shaping the journey to a new mobile age.
Choose an innovative, future-oriented and international partner and benefit
from our expertise in the fields of Industry 4.0 and digitalisation.

>33,000
catalogue products

Subsidiaries in

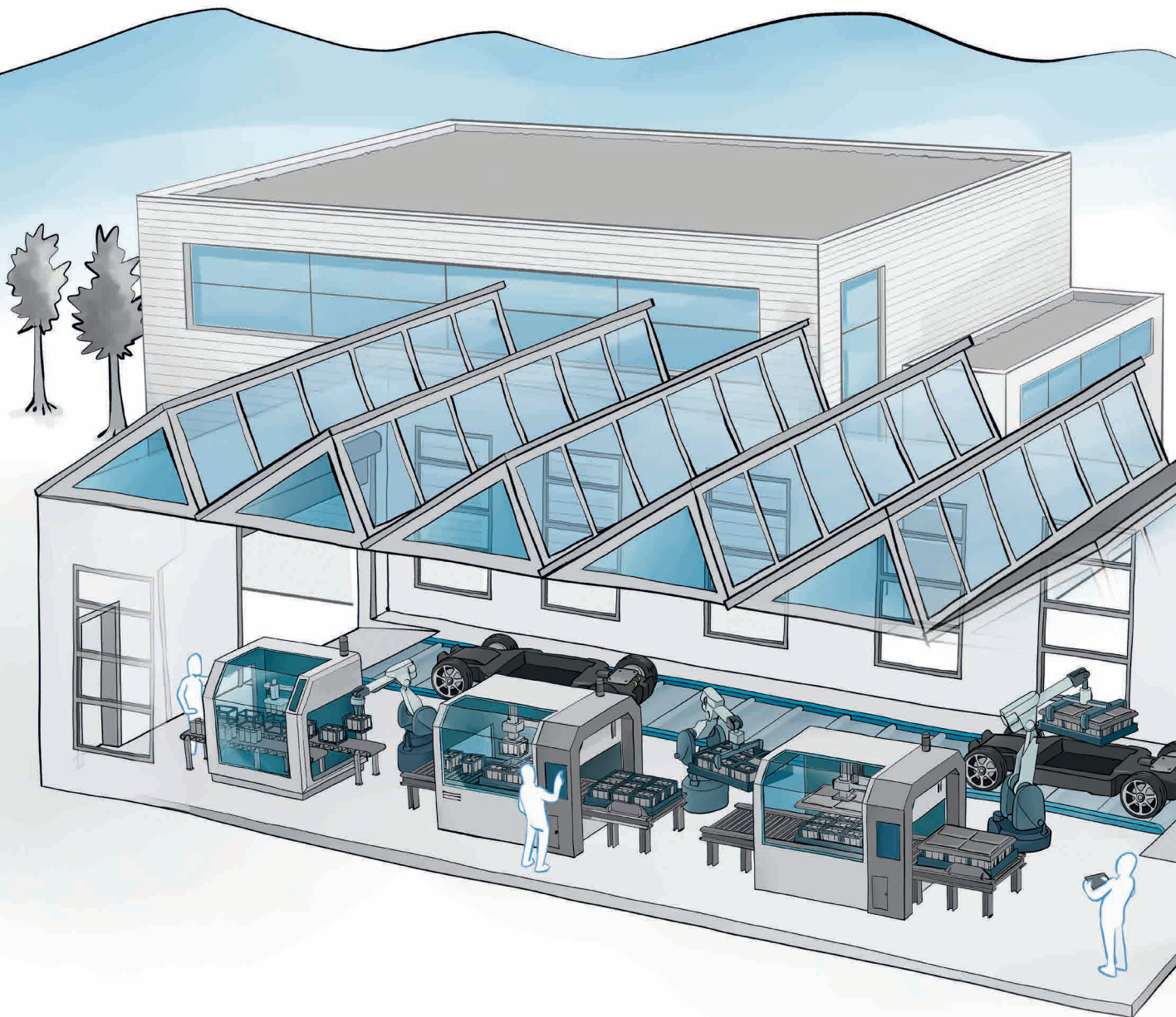
61
countries



13
global production centres

Electromobility powered by Festo

One of the barriers to the ultimate breakthrough of electric vehicles is the high purchase price compared with vehicles with an internal combustion engine (ICE). But with innovative concepts, flexible, robust and scalable production methods can be put into place that will drive down manufacturing costs even as the variety of models increases. By automating production as well as digitally networking plant structures and production technologies you will now take the lead on the journey to optimising resources, from the concept stage to the product. All completely in line with OEE, OPEX and CAPEX criteria.



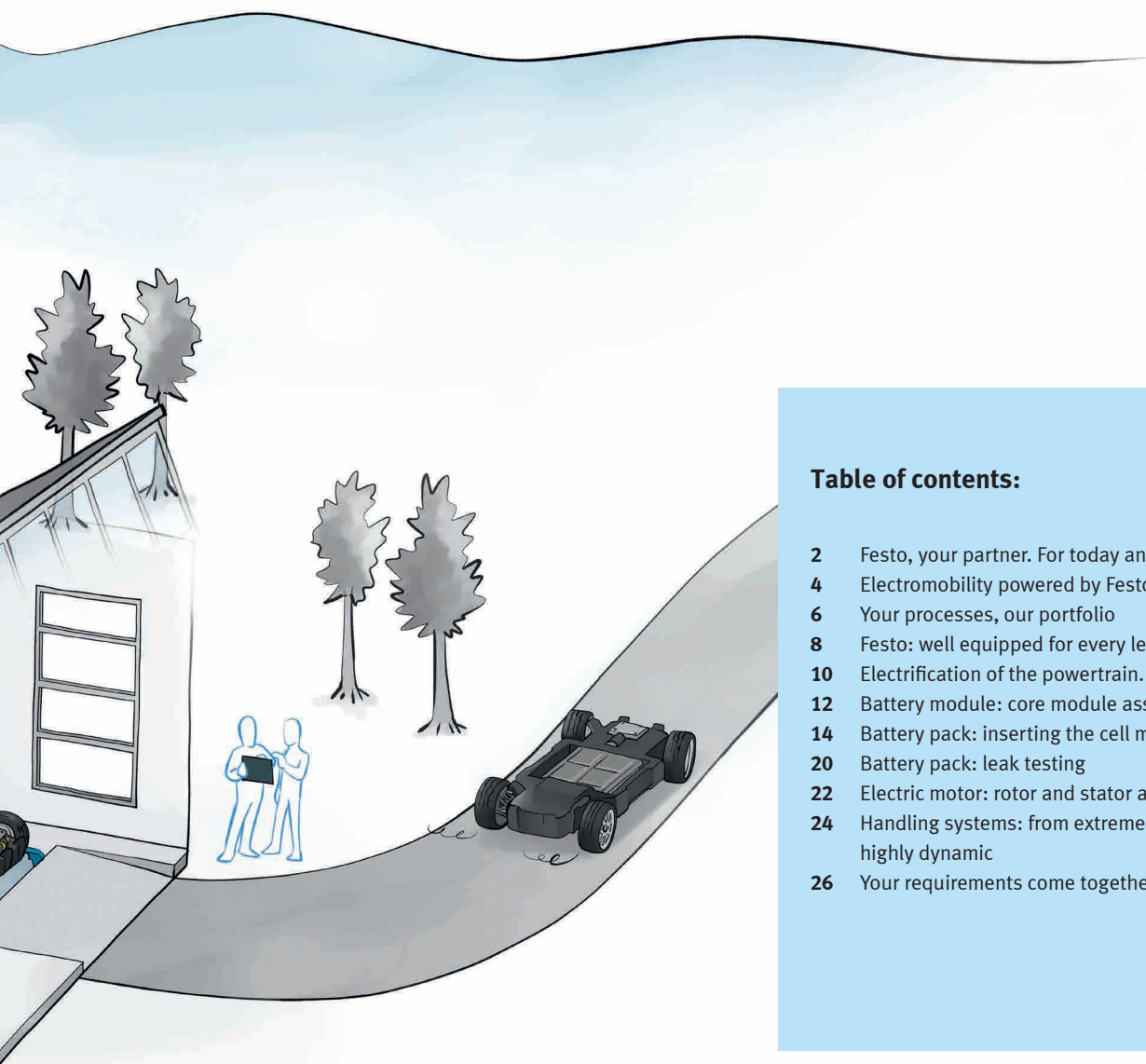


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Your processes, our portfolio

The efficient production of components for the electric powertrain is a deciding factor in the economic success of electromobility. Changing production volumes and structural geometries must be taken into account. High standards of occupational safety also have to be observed, and all the individual production steps have to be continuously monitored and documented too. Discover our extensive portfolio – we have the right solution for your requirements, whether electric, pneumatic or a combination.

We are your technology partner in the electrification of the powertrain

Fast

EXCT
Highly dynamic



Linear gantries

Easy

DFPD
Compact



Quarter turn actuators

Sturdy

AEN-S
Reliable



Compact cylinders



Precise

VEAA
Quiet and durable



Piezo valves

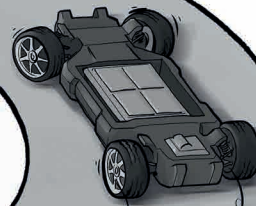


Intelligent

SOOE
With IO-Link® capability



Opto-electrical sensors



Adaptive

DHEF/DHAS
Flexible and gentle



Adaptive gripper fingers



Flexible

EPCO
Easy sizing



Electric cylinders

Festo: well equipped for every level of automation

The demand for high volumes at low production costs is growing. When combined with the requirement for greater variety and flexibility, it is no wonder that the right level of production line automation is becoming more important. In many cases it is a mix of different configurations – ranging from minimal to full automation – that is the most cost-effective. It is a good thing, then, that Festo can offer a comprehensive solution portfolio, whether for simple mechanical systems or for fully automated and digitised production lines. Your requirements are our mission!

Factors influencing the selection of the level of automation:

- Quantity
- Complexity
- Flexibility
- Production cycle
- Production volume
- Quality
- Investment volume

Level of automation

Manual workstation



At a manual workstation, conventional pneumatic components from Festo support the manual tasks through:

- Compressed air treatment
- Mechanically actuated valves
- Push-in connectors
- Tubing
- Tubing/fitting combinations

Semi-automated

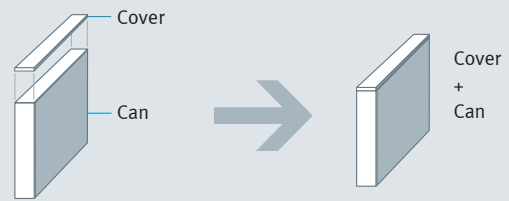


At a semi-automated workstation, other pneumatic and electric components from Festo complement the functions of:

- Cylinders
- Valves and valve terminals
- Simple electric drive and control technology
- Vacuum technology
- Mechanical gripping

Different solutions using the example of an assembly system

Let's assume a cover has to be fitted on a basic body (can) so that it fits precisely and is not damaged. This is the technique used in the electrification of vehicles to insert cell bodies, modules or electronic modules into their housings before they are sealed. When defining the appropriate level of automation, all relevant influencing factors must be examined and evaluated.



Industry 4.0

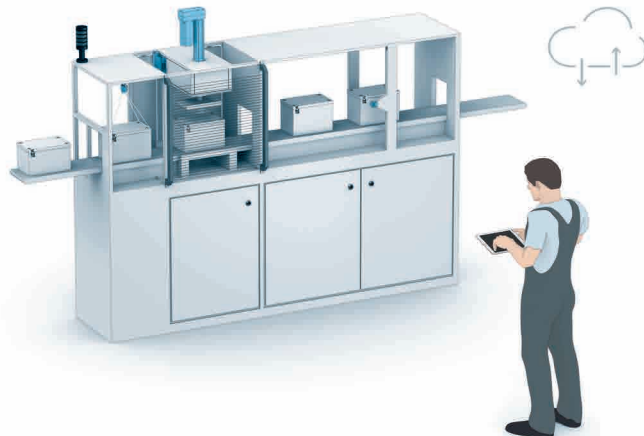
Automated systems



In automated systems, Festo components and systems are the perfect way to expand movements and sequences, for example through:

- Servo and stepper motors
- Electromechanical systems
- Sensors
- Controllers and software
- Function-specific systems

Fully automated production lines



Fully automated production lines consist of several automated systems that are linked together. They generate and process a large amount of data and information. With seamless connectivity from the mechanical system to the cloud, condition monitoring and Industry 4.0 solutions, Festo increases efficiency through:

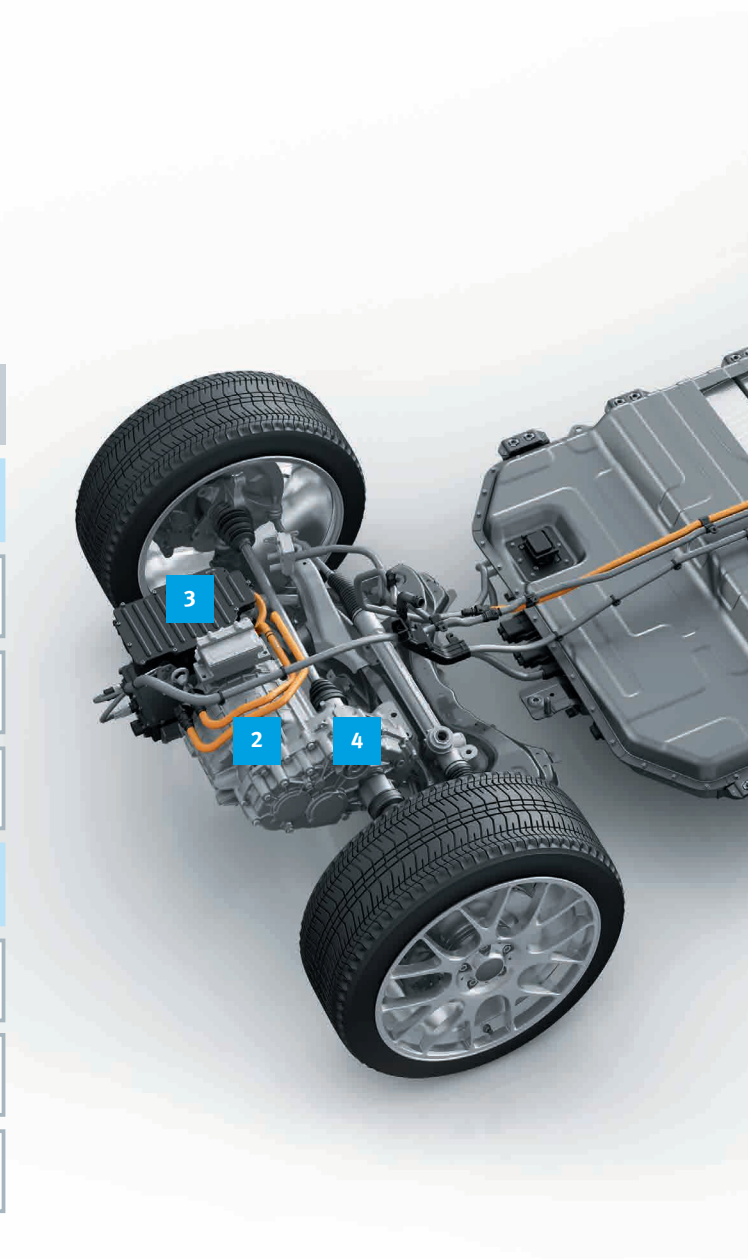
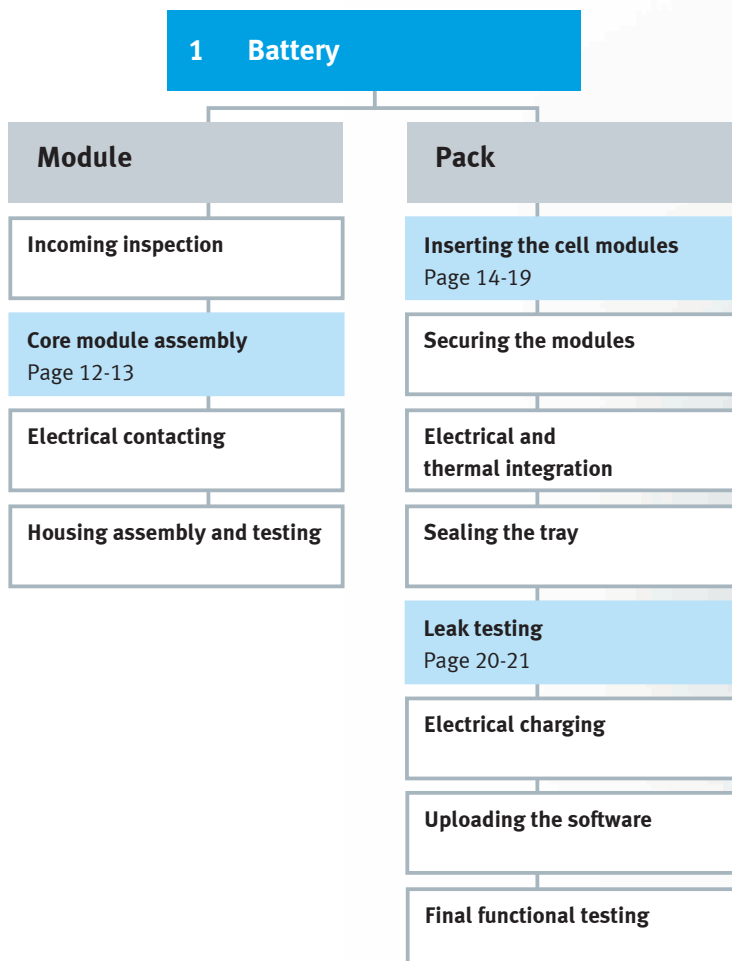
- Handling and gantry systems
- Industrial robots
- Dashboards
- Artificial intelligence
- Cloud connectivity

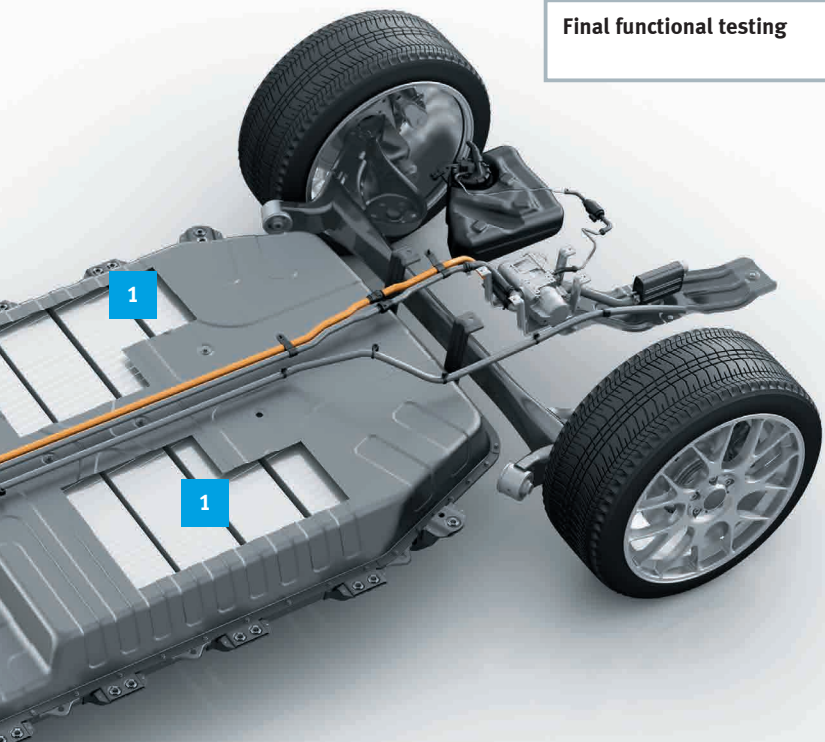
Electrification of the powertrain. We're on board

The requirement for ever-lower emissions is accelerating the automotive industry's electrification strategies. The product line-up on offer now ranges from HEVs (ICE combined with an electric powertrain) to so-called plug-in PHEVs (rechargeable hybrids) to purely electrically powered vehicles (BEVs). It is not just the number of variants that is increasing, but also the complexity of the powertrain due to the large number of additional components in the vehicle. These are primarily battery modules, battery packs, electric motors, power electronics and transmissions.

At Festo, we have looked closely at the main process steps and the associated automation technology this requires. Our comprehensive portfolio together with our expertise makes a valuable contribution to reliable and flexible production, especially for key applications.

Are you interested in learning more? → [Get in touch with us.](#)





2 Electric motor

Rotor, stator and housing production

Rotor assembly
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Stator assembly
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Final assembly

Final functional testing

3 Power electronics

Housing production

Cable preparation

Assembly of the power electronics

Final functional testing

4 Transmission

Gear, shaft and housing production

Module assembly

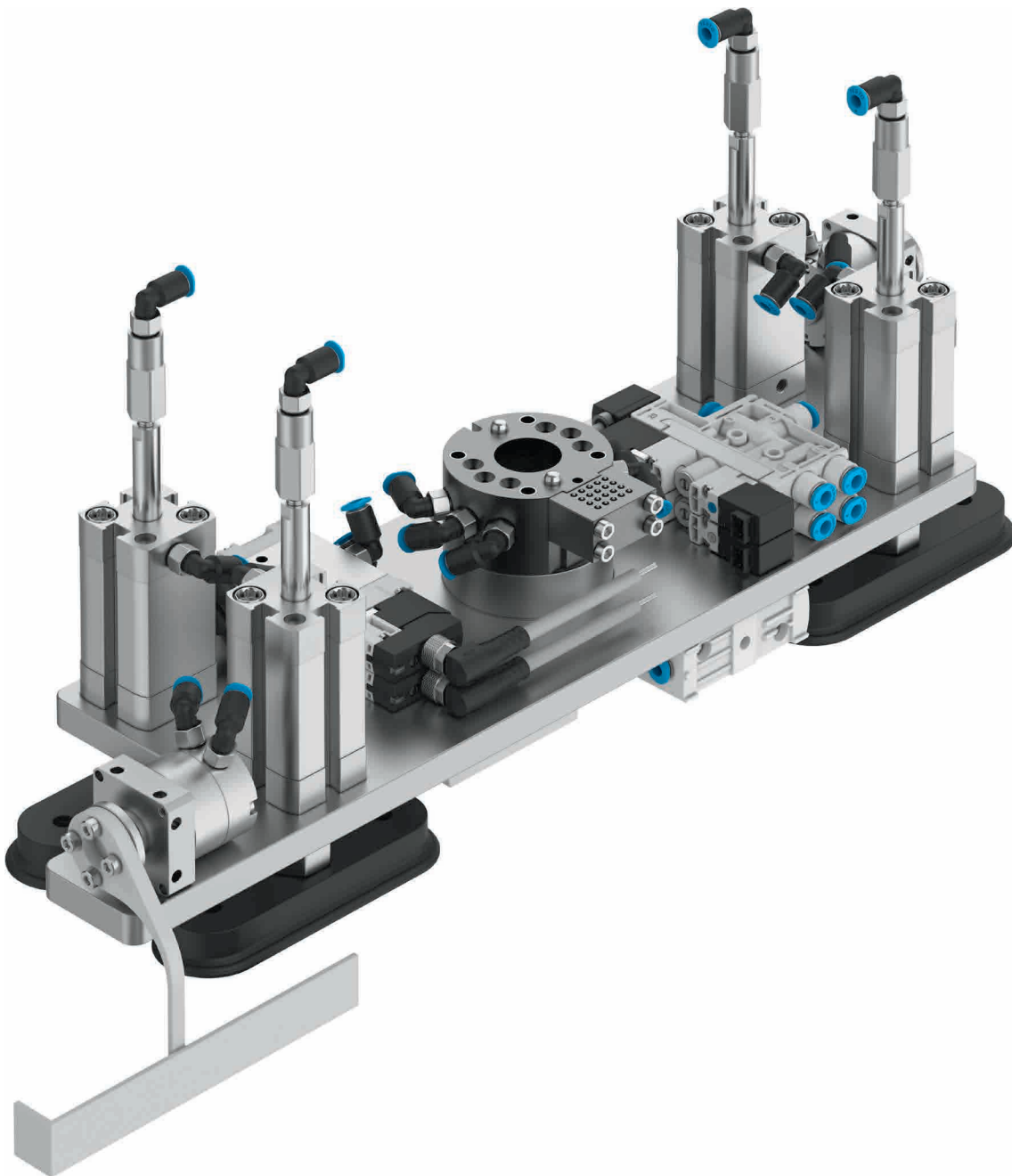
Final assembly

Final functional testing

Battery module: core module assembly

One of the most important components in the electrified powertrain is without a doubt the battery cell. There are three main battery types that are used for energy storage in the vehicle, depending on the manufacturer and module design: cylindrical cells, pouch cells and prismatic cells. Most of the time modern lithium-ion batteries are used because of their high energy and power density

While the assembly of classic internal combustion engines involves the highly precise assembly of mechanical components, the production of battery modules involves assembling extremely expensive and dangerous electrochemical components. Festo offers perfectly matched solutions – especially in the area of handling technology – for example for sturdy, reliable and precise gripping of battery cells.



Just to make sure

To avoid unintentional loss of the cell, mechanical fixings are moved into position under the cell using a swivel module while the complete kinematics is moving.



Swivel module DSM

- Steady movement at low pressure
- Short swivel times
- Infinitely adjustable swivel angle up to 270°
- Effective cushioning

Gripping feedback

Short-stroke cylinders combined with position sensors not only compensate for any surface irregularities in the cells, but also feed back precise values through analogue sensing of the gripping position. This is ideal for statistical process monitoring.



Compact cylinder ADN

- Quiet and smooth
- Long service life
- Easy to maintain thanks to uniform cushioning characteristics
- Stroke: 1 ... 500 mm
- Piston Ø: 12 ... 125 mm

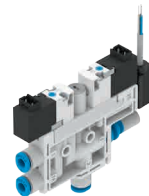


Position transmitter SDAT

- For T-slot
- LED status indicators
- Programmable IO-Link®/switching output
- Position measuring range: 0 ... 160 mm
- Analogue output: 4 ... 20 mA

Double the grip

Vacuum systems with very lightweight and compact vacuum generators are used for reliable gripping. They create a double-redundant design directly in the gripping system itself.



Vacuum generator OVEL

- Electric ejector pulse
- Cost-effective, decentralised vacuum generation
- Various performance levels and vacuum types
- Short switching times thanks to integrated solenoid valves
- Operating pressure: 2 ... 7 bar

Secure but gentle

Some of the materials are extremely delicate and need to be gripped very gently. The suction grippers therefore have profile knobs on the gripping surface, reducing the stress on the cell surface to a minimum.



Suction cup OGVM

- Highest lateral forces
- Maximum process reliability
- High inherent stability during suction
- Suction cup size: 16 x 55 mm to 70 x 145 mm
- Vacuum connection: G1/4

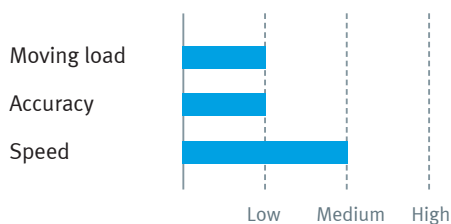
Battery pack: inserting the cell modules

Once the batteries have been assembled into modules, they are inserted into the final pack. As the reliability of a passenger car or lorry relies heavily on the component safety of the battery, the individual assembly processes for the battery packs are usually fully automated.

Joining methods such as gluing and screwing in are therefore used alongside classic precision handling technologies. This places very different requirements on the drive components and gantry systems to be selected.

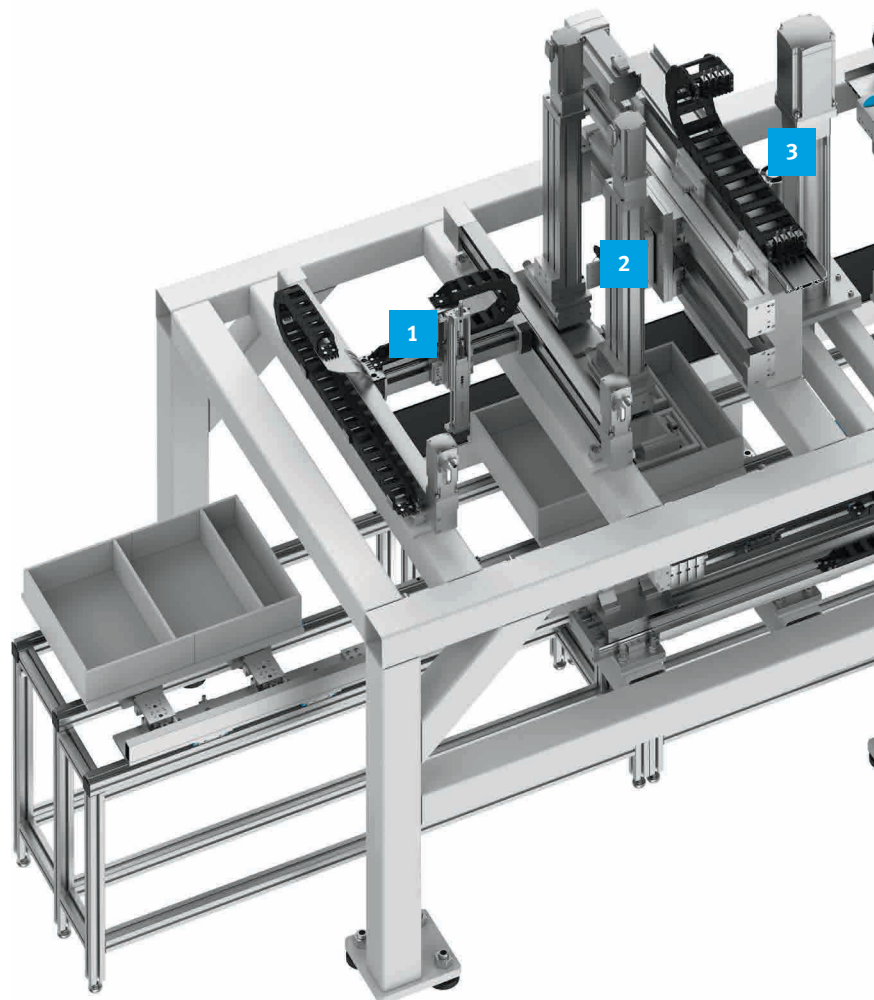
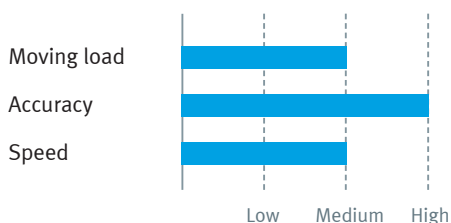
1 Applying thermal paste

The thermal pastes applied ensure temperatures are managed as effectively as possible during vehicle operation.

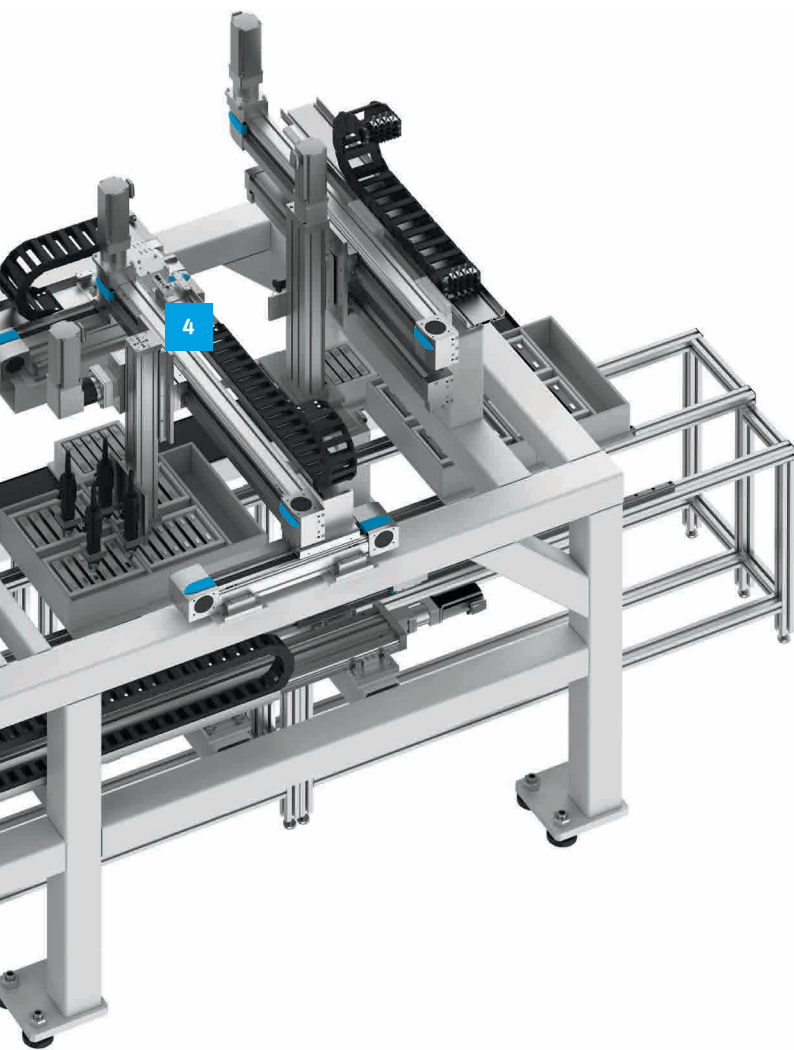


2 Inserting the modules

The final positioning of the modules calls for precise alignment and orientation. Often modules are offset by 180° in relation to each other so as much space as possible can be saved during their subsequent electrical connection.

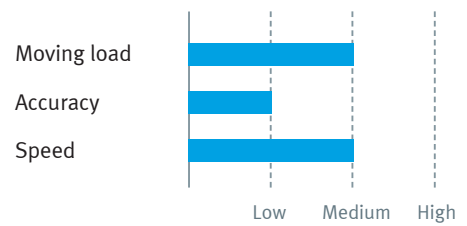


The key to efficient and cost-effective solutions is to look at the individual requirements of each application.



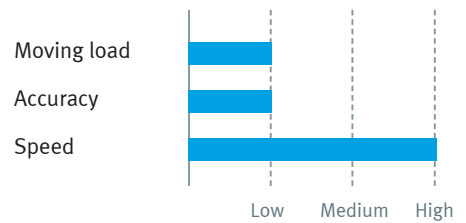
3 Pressing in the modules

To ensure that the modules are bonded as homogeneously as possible with the thermal paste, a pressing station can be used. Here the components are pressed into the applied paste to a specific height.

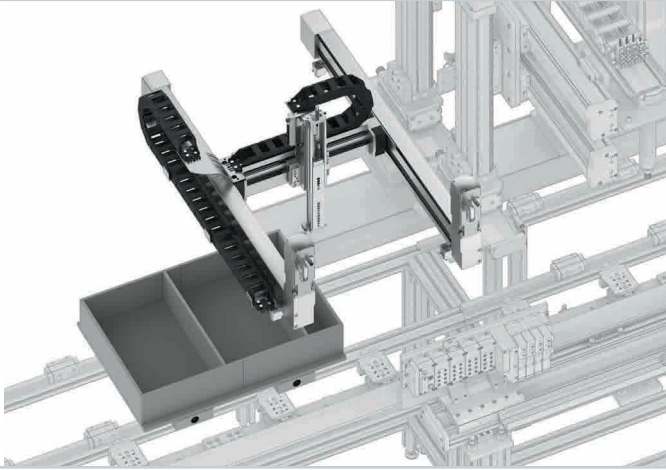


4 Screwing in the modules

The last fastening step is done by screwing in or crimping. Screwdrivers are moved in position and lowered in a controlled way.

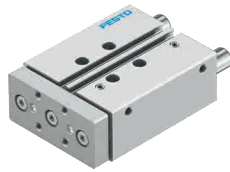


Battery pack: inserting the cell modules



Applying thermal paste

The battery cell as an electrochemical component should, if possible, always be able to operate in an ideal temperature range, regardless of wind and weather influences. This requires the installation of a so-called thermal management system in high-voltage systems. For efficient thermal transfer, paste-like thermal conductors are frequently used that must be supplied and dispensed with great accuracy. Festo components play an important role here.



Guided drive DFM

- High resistance to torsion and rigidity
- Sturdy and precise
- Drive and guide in a single housing
- Plain or recirculating ball bearing guide
- Piston Ø: 12 ... 100 mm
- Stroke: depending on piston diameter 10 ... 400 mm



One-way flow control valve GRLA

- Exhaust air one-way flow control function
- Sturdy and precisely adjustable
- Quick and easy to mount
- Integrated QS push-in connector
- Male thread: M3 to G3/4
- Optimised for flow rate: 100 ... 580 l/min



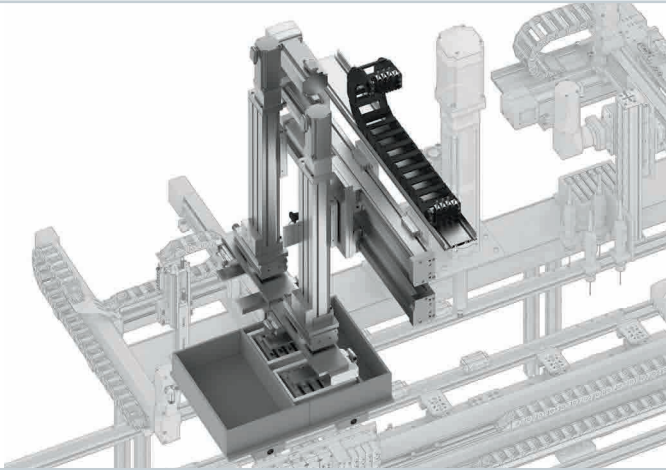
Proportional pressure regulator VPPM

- Piloted pressure regulator
- Multi-sensor control
- With IO-Link® and fieldbus/Ethernet capability
- Integration in valve terminal MPA
- Integrated pressure sensor
- Pressure regulation range: 0.02 ... 10 bar
- Standard nominal flow rate: 380 ... 7000 l/min
- Sub-base: G1/8, G1/4, G1/2



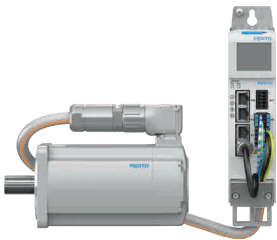
Vacuum generator OVEM

- Vacuum sensor for monitoring vacuum
- With IO-Link® capability
- Teach-in via display and pushbuttons
- Integrated check valve: prevents a pressure drop after the vacuum is switched off
- Fast vacuum build-up with integrated solenoid valve
- Separately controllable ejector pulse
- Max. suction rate with respect to atmosphere: 6 ... 348 l/min
- Vacuum connection: G1/8 to QS16



Inserting the modules

As the modules are inserted into the thermal paste, the narrow tolerances normally require a highly precise gripping system with position correction.



Servo motor EMMT-AS

- Brushless, permanently excited synchronous servo motor
- Digital absolute displacement encoder for single-turn or multi-turn
- Extremely low cogging torque supports high synchronisation

- even at low rotational speeds
- Simple OPC (one cable plug) connection technology: just one connecting cable for supply and encoder
- Optionally with holding brake
- Degree of protection IP67 (housing), IP40 (shaft), optionally IP65 with sealing ring

- Single-turn or multi-turn, absolute encoder
- Three sizes: flange size 60/80/100 with up to 2.6 kW/9.8 Nm

Servo drive CMMT-AS

- Precise force, speed and position control
- Bus protocols: EtherCAT®, PROFINET, EtherNet/IP and Modbus TCP

- From point-to-point to interpolated motion
- Quick commissioning using the Festo Automation Suite
- Safety: numerous protective functions already built-in

- Number of phases: 1-phase (230 V), 3-phase (400 V)
- Nominal power: 350 ... 6000 watts



Electric cylinder ESBF

- High feed forces with limited installation space
- Optionally with high corrosion protection
- Ball screw: three spindle pitches for selecting the optimal force/speed ratio

- Axial or parallel motor mounting
- Choice of two spindle types:
 - Size 32 ... 50 (ball screw and lead screw)
 - Size 63 ... 100 (ball screw)
- Stroke: 300 ... 1500 mm
- Degree of protection IP65



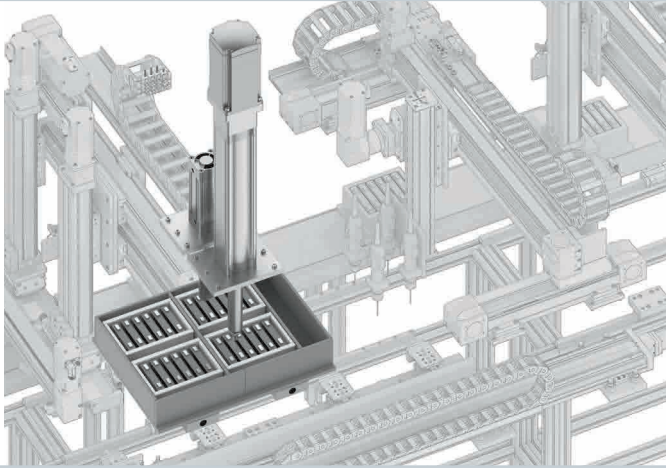
Turnkey drive systems via Festo Automation Suite

Parameterisation, programming and maintenance of Festo components in a single program – perfect for quick commissioning of the entire drive package, from the mechanical system to the controller.

- More individual, intuitive and user-friendly than ever before
- Uniform user interface
- The basic functions of all Festo components have already been integrated
- Can be customised with device plug-ins and add-ons
- Information about devices and

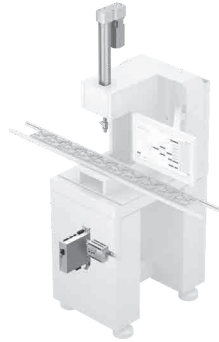
- operating instructions can be accessed directly using the software
- Available free of charge on the Festo Support Portal

Battery pack: inserting the cell modules



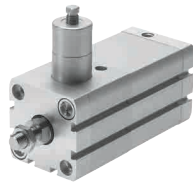
Pressing in the modules

By pressing the module, its contact surface with the thermal conductor is maximised. It also guarantees that the pack is geometrically correctly positioned so that it can be screwed in and sealed during a subsequent process step.



Servo press kits YJKP

- For electric joining and pressing applications
 - Press forces up to 17 kN
 - Pre-installed, modular software and pre-assembled kit
 - Easy to integrate into your own system concept
- Fit for Industry 4.0 thanks to the OPC UA interface on the controller



Compact cylinder ADN

- Quiet and smooth
 - Long service life
 - Easy to maintain thanks to uniform cushioning characteristics
 - Stroke: 1 ... 500 mm
- Piston Ø: 12 ... 125 mm
 - Self-adjusting pneumatic end-position cushioning



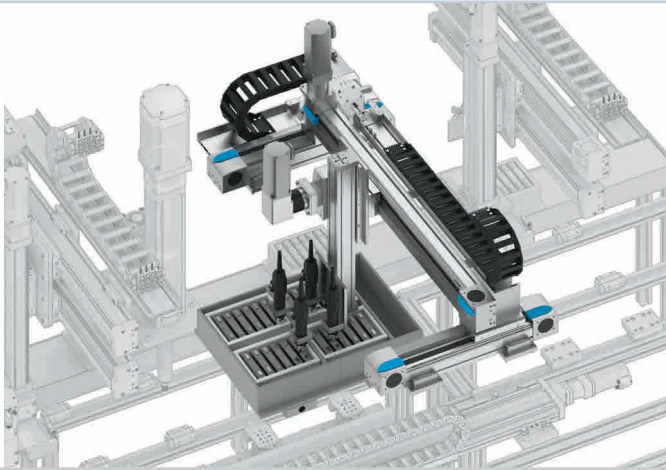
Standards-based cylinder DSBC

- Self-adjusting pneumatic end-position cushioning that adapts optimally to changes in load and speed
 - Wide range of variants
 - Comprehensive range of mounting accessories for just about every type of installation
- For position sensing
 - Piston Ø: 32 ... 125 mm
 - Stroke: depending on design 1 ... 2800 mm



Soft-start/quick exhaust valves MS6-SV-D/E

- Reliable 2-channel exhausting with self-monitoring up to Performance Level e and category 4 to EN ISO 13849-1
- For both quick and reliable as well as gradual pressure build-up
 - Connection: G1/2
 - Flow rate: 4300 l/min



Screwing in the modules

Since the pack is part of the vehicle, it also needs to meet all crash test requirements and, as a last step, must be mechanically attached to the car underbody. This is supported by dynamic positioning of the screwdriving systems.



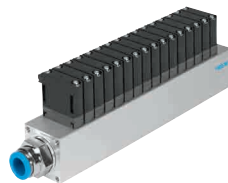
Feed separator HPV

- Replaces at least two drives in the feed process to reduce costs
- Design with two plungers, twin piston, non-rotating piston rod and locking mechanism
- Proximity switch SME/SMT-8 can be integrated in the housing
- Piston Ø: 10, 14, 22 mm
- Stroke: 10 ... 60 mm
- Force: 45 to 225 N



Piezo valve VEA

- No self-heating
- No operating noise
- Extremely long service life
- Energy consumption: < 0.1 W at 5 Hz
- Flow rate: 55 ... 70 l/min
- Nominal width: 1.2... 1.7 mm
- Operating voltage: 0 ... 300 V



Fast-switching valve MHJ10

- Directly actuated poppet valve
- Individual valve with integrated QS fitting
- Switching frequencies: up to 1000 Hz
- 2/2-way valve
- Flow rate: 50 ... 100 l/min

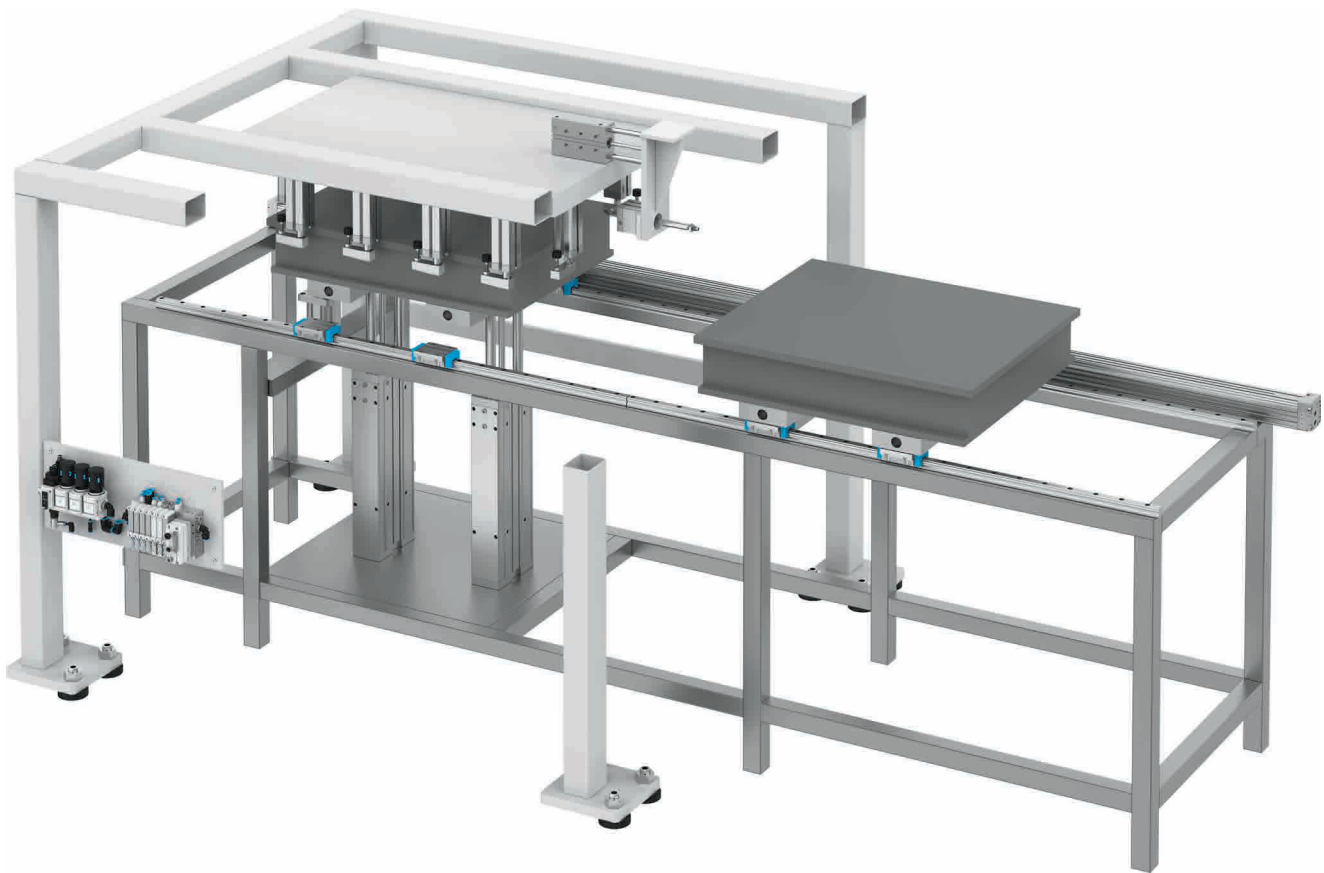


Mini slide DGST

- Shortest mini slide on the market
- Powerful twin-piston drive
- Precise roller bearing guide
- Versatile mounting options for proximity switches
- Piston Ø: 6 ... 25 mm
- Stroke: depending on design 10 ... 200 mm

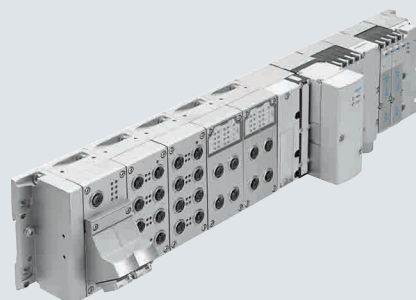
Battery pack: leak testing

Like all components used in passenger cars and lorries, battery packs are also exposed to the weather. That is why classic IP67 tests often have to be conducted in addition to testing the vehicle's cooling systems for leaks.



Core competency in automation 4.0

Whether for connection or for data evaluation, the electrical terminal CPX from Festo in combination with the valve terminal MPA impresses thanks to its maximum function integration. It supports you on two levels: pneumatically, by linking proportional and standard pneumatic components and regulating the pressure supply; and digitally with comprehensive diagnostic and condition monitoring functions. In addition, it provides universal communication options via fieldbus or Ethernet, since our pneumatic and electric control chains can be integrated into all automation concepts and company-specific standards. With Industry 4.0 included.



Monitoring and analysing

Stable and transparent framework conditions are the basis for reliable tests. And you can certainly rely on Festo service units. They meet the highest standards for performance, accessibility and expandability.



Energy efficiency module MSE6-C2M

- Automatic pressure reduction without exhausting the system during downtimes
- Detecting leaks by evaluating the pressure drop in stand-by mode
- Adjustable pressure increase (soft-start)
- Fieldbus node for PROFINET IO
- Standard nominal flow rate q_{nN} : 5000 l/min

Stopping and lifting

Because of the installed memory capacity, the load to be stopped is dependent on the future electric range. However, the reproducibility of the stop position must always be guaranteed. Lifting, on the other hand, depends on a very consistent and controlled pressing process.



Stopper cylinder DFST

- Integrated, adjustable shock absorber for smooth and adapted stopping
- Position sensing on the piston
- Flexible and sturdy
- Automated enable of the lever deactivating mechanism
- Piston \varnothing : 50, 63, 80 mm
- Stroke: 30, 40 mm
- Pneumatic connection: G1/8

Accelerating and stopping

The sensor must be coupled with precision and a high level of reproducibility so as not to distort the subsequent measurement result. A solid concept is characterised on the one hand by space-saving media routing and on the other hand by quick and maintenance-friendly access to the measuring tip.



Guided drive DFM

- Minimal space requirement
- Selectable compressed air supply port
- High resistance to torsion and rigidity
- Maintenance-free
- Stroke: depending on size 10 ... 400 mm

Clamping and locking

The final clamping motion should, if possible, be completely linear so there are no lateral forces on the connection between the battery tray and the cover. This is because leaks or damage to the seal would have immeasurable consequences.

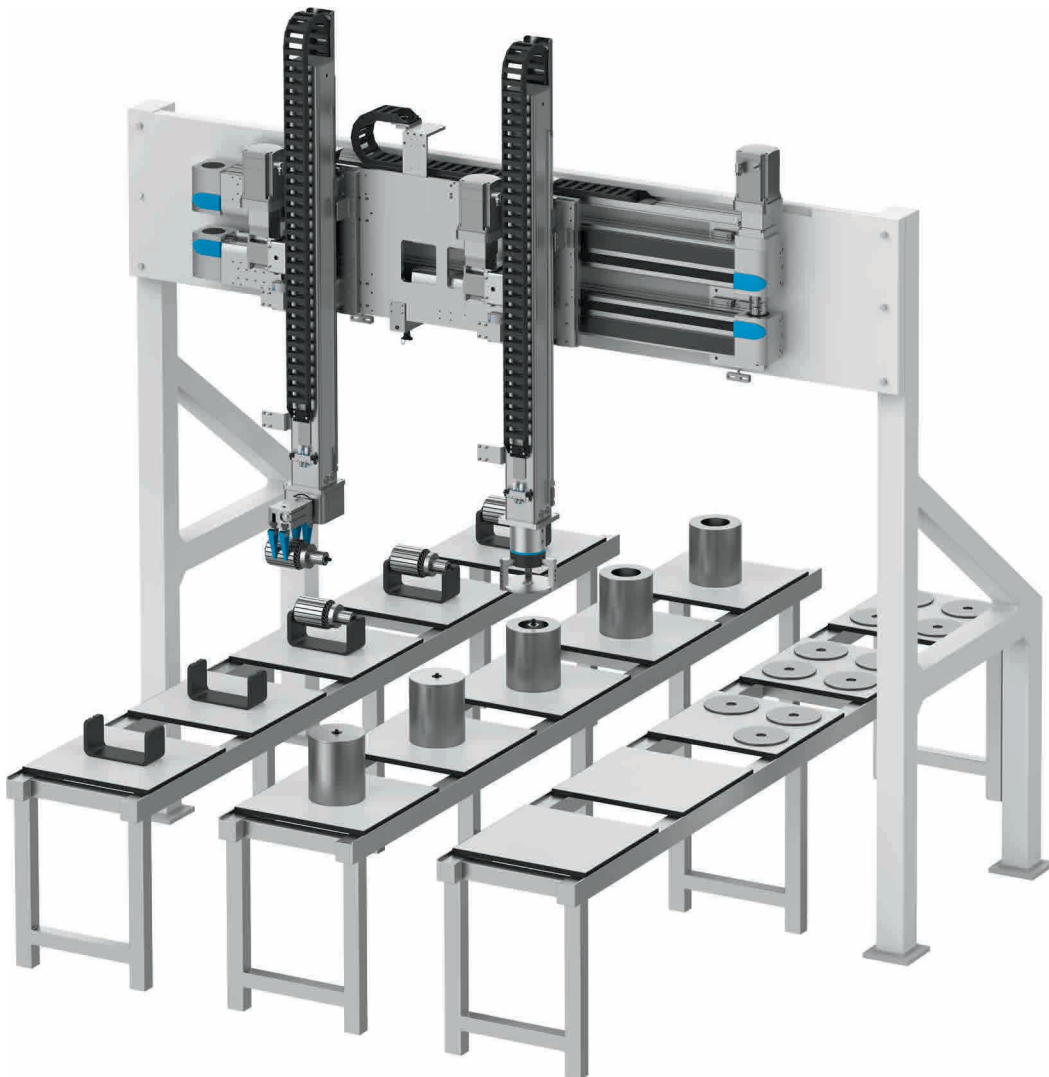


Linear/swivel clamp CLR

- Flexible alignment of the clamping finger
- Absorption of high clamping torques
- Subsequently adjustable swivel direction
- Piston \varnothing : 12 ... 63 mm
- Clamping stroke: 10 ... 50 mm
- Pneumatic connection: M5 and G 1/8

Electric motor: rotor and stator assembly

At first glance, electric motors seem to be mainly produced using established technologies. The actual challenges for production plants are about having to maintain consistently high quality and precision in high-volume production. After all, the parts which are often cylindrical must be repeatedly aligned, turned and joined. Thanks to the wide range of linear axis systems, swivel units and grippers, Festo always has the right solution.



Totally reliable

Optimum holding, sufficient clamping force, precise positioning and reliable movement – that is what's important when gripping workpieces. Festo offers a wide range of solutions, from components for simple gripping movements to components that enable the front end unit to be turned, screwed in and moved. Whether with or without a seal, every gripper is available with a standard

interface plate so it can be quickly connected to the Festo Automation Platform. Selecting the correct gripper and the correct vacuum system is incredibly easy thanks to our free of charge online engineering tools.

Gripping and centring

The parts that are fed in and roughly aligned must be adjusted for the remainder of the process.



Three-point gripper DHDS

- Heavy-duty, precise T-slot guide for gripper jaws
- High gripping force and compact size
- Sizes: 16, 32, 50
- Stroke per gripper jaw: 2.5 mm, 3.9 mm, 6 mm
- Pneumatic connection: M3 to G1/8

Gripping and turning

The cylindrical parts that often lie horizontally must be reliably gripped, precisely turned and joined with high linear precision.



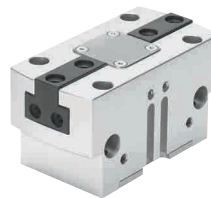
Electric drive ERMO

- With stepper motor and integrated gear unit
- Sturdy and precise
- Sizes: 12, 16, 25 mm
- Repetition accuracy: $\pm 0.05^\circ$
- Nominal torque: 0.15/0.8/2.5 Nm
- Nominal operating voltage: 24 V DC

Reliable gripping

Precise and dynamic gripping requires optimal sizing of the gripper drives.

The goal is to ensure that the produced parts are always securely gripped, even in unforeseeable situations.



Parallel gripper HGPT-B

- Maximum gripping force with reduced weight
- Spring-assisted opening or closing
- Sizes: 16 ... 80
- Stroke per gripper jaw: 1.5 ... 25 mm depending on size
- Pneumatic connection: M5, G1/8, G 1/4

For vertical axes

- Take advantage of electric or pneumatic solutions – with toothed belts, spindle or rack and pinion technology.
- Move up to 200 kg with high dynamic response and precision thanks to the stainless steel profile of the EMMH axis.
- Configure your axis so that it has a clamping unit on the guide or a pneumatic locking unit that prevents objects from falling during an emergency stop, power failure or maintenance work.



EMMH



ELCC



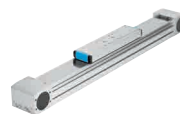
DGSL/EGSL

For horizontal axes

- Take advantage of the comprehensive range of sturdy axes with single or twin guide (EGC/EGC-HD) or covered guide (ELGA).
- Improve the reliability of your system under harsh conditions by using additional scrapers, polyurethane belts and a central lubrication kit.
- Define a cost-effective solution with a combination of electrics and pneumatics.



Spindle/toothed belt axis EGC-HD



Spindle/toothed belt axis ELGA



Linear drive DGC/DGC-HD

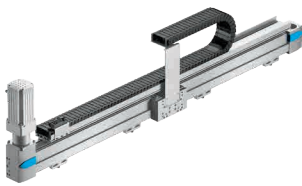
Handling systems: from extremely compact or sturdy to highly dynamic

From extremely compact or sturdy to highly dynamic

1D handling systems

1-axis systems

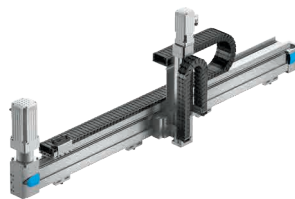
Ideal for long, one-dimensional strokes and heavy loads



2D handling systems

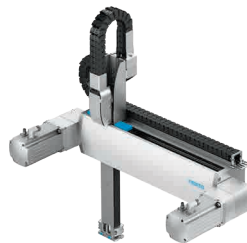
Linear gantry

For vertical movements in 2D



Highly dynamic linear gantry

Optimum dynamic performance with up to 90 picks/minute



Planar surface gantry

For any movements in 2D space



Highly dynamic planar surface gantry

Large work area and high dynamic performance



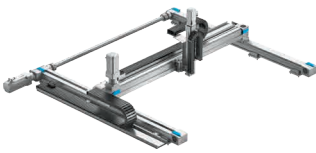
Compact planar surface gantry

Compact and flat for small installation spaces

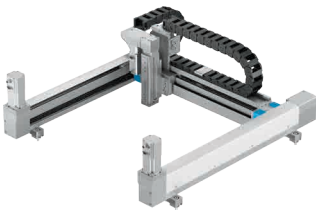


3D handling systems

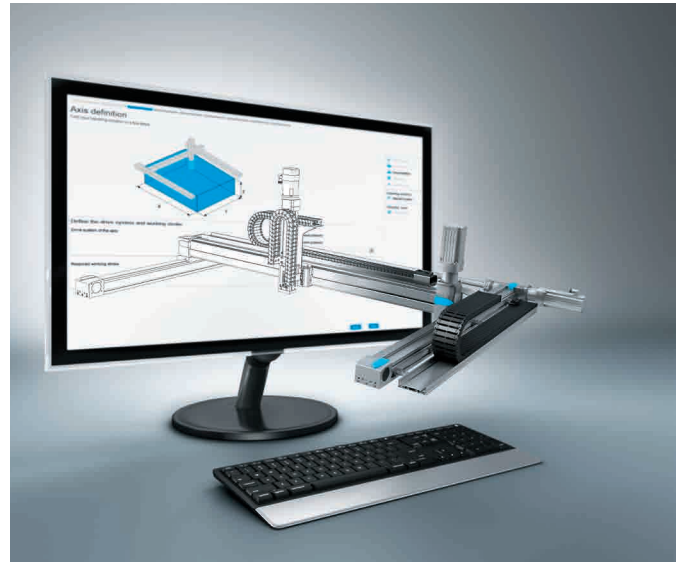
3-dimensional gantry
for 3D movements in space



Highly dynamic 3-dimensional gantry
Large work area and high dynamic performance



Compact 3-dimensional gantry
Compact and flat for small installation spaces



Handling Guide Online for correctly sizing industrial robots

Configure industrial robots – from a single-axis solution to 3D gantries – quickly and easily. Just enter the axis definition along with all the performance parameters needed, and in just 20 minutes you will have a perfect and ready-to-order system. We will deliver it, either ready to install or partially assembled, together with the CAD data and commissioning documents.

→ www.festo.com/hgo

Your requirements come together with our expertise

Our wide product portfolio means we can always specifically address your requirements. In addition, all the knowledge and many years of experience of Festo are available to you to optimise the machine safety and energy efficiency of your production in a targeted way. You can also take advantage of information, training and advice brought to you directly by Festo Didactic. And you can make the most of comprehensive concepts such as our Energy Saving Services.



Core product range

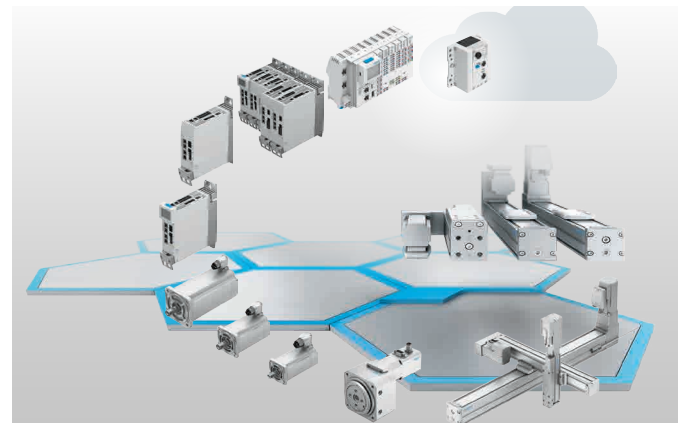
High quality at an attractive price, available worldwide at short notice even in large quantities: our core product range impresses on all counts. It keeps you competitive by providing the outstanding technological support you need to get your products to customers more quickly. The core product range solves the majority of your automation tasks, in factory automation as well as in process automation. From drives to accessories, both for electric and pneumatic control chains. And all with greatly reduced procurement complexity.

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Seamless connectivity

Put your trust in a partner who has been setting technological standards for decades, whether in pneumatic or electric automation. And expect nothing less than a comprehensive range of solutions, from mechanical systems, integrated motion control solutions and subsystems to modern cloud solutions for a variety of industries. That's what we understand by automation without compromise.

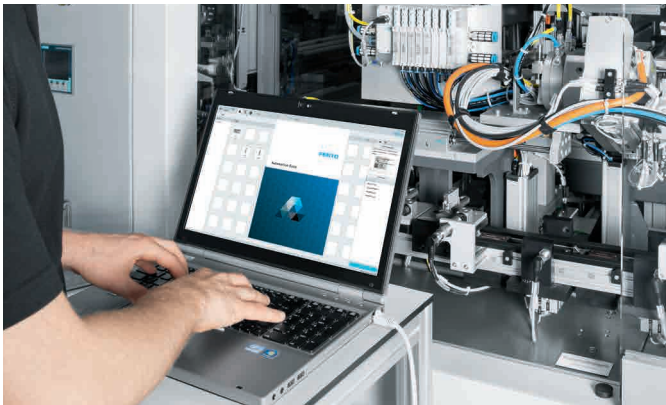
→ connectivity.festo.com



Digital transformation

The fusion of industrial automation and digitalisation is the driver for Industry 4.0. Festo already has smart and communication-enabled components for this, like the Festo Motion Terminal VTEM and the energy efficiency module MSE6. Connectivity as well as the acquisition and interpretation of data are state of the art at Festo – on edge, on premises or in the cloud. Festo Automation Experience is opening up other new perspectives. Use data analytics, machine learning and artificial intelligence to optimise processes and consistently improve your overall equipment efficiency and energy efficiency.

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**Quick commissioning of an entire drive solution:
Festo Automation Suite**

The PC-based software Festo Automation Suite combines the parameterisation, programming and maintenance of Festo components in one program. It enables the entire drive package, from the mechanical system to the controller, to be commissioned. Perfect for making industrial automation simple, efficient and seamless.

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Machine safety

Where are the safety-critical points in your production? And how can you easily equip these points with safety technology? Our complimentary guide to safety engineering answers key questions about safety-related pneumatics and electrics. It lists standards and guidelines and offers suitable solutions.

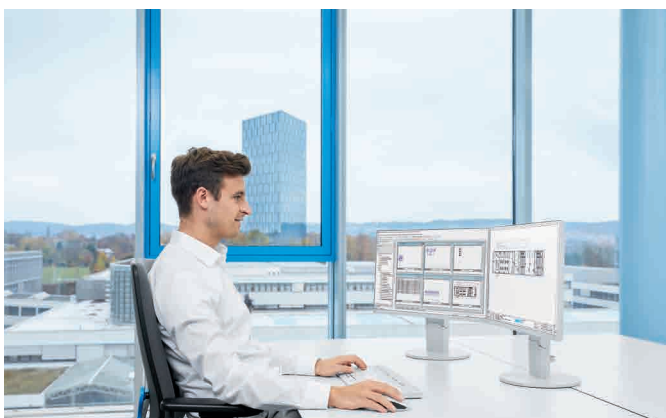
Download it now:

→ www.festo.com/maschinensicherheit

Energy efficiency

Whether in battery pack assembly or the production of the electric motor and transmission, secure yourself a decisive increase in efficiency. We support you with energy-saving products and solutions for all areas of production, in engineering as well as in operation.

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We support you along the entire life cycle of your projects, from planning to commissioning right up to the operation and maintenance of the machine. Our comprehensive engineering and simulation software will enable you to start your projects quickly and prevent human errors. For example, you can automatically generate the EPLAN schematic diagram for EPLAN projects without having to identify and put all the components together in a time-consuming process.

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Maximum productivity is a question of ambition

Do you share this attitude? We will be glad to help you achieve this goal – through our four outstanding qualities:

- Security • Efficiency • Simplicity • Competency

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