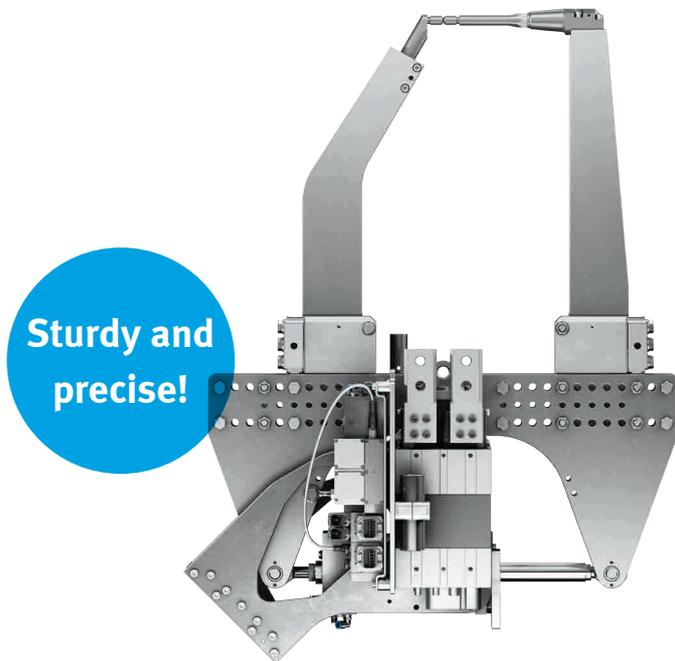


Servo-pneumatic drive solution for welding guns

FESTO



Sturdy and
precise!

Top quality welding!

Highlights

- Extremely short cycle times
- High quality and outstanding reproducibility of the spot welds
- Excellent value for money
- Individual components fit for Industry 4.0
- Reduced cabling
- No control cabinet required
- Software for easy commissioning and diagnostics

When it comes to car body welding, high precision and robustness are required. The components from Festo for servo-pneumatically driven welding guns are specially designed to meet this requirement. You decide which is best for you – the X gun or the C gun. Our range of types and designs makes pneumatics for spot welding extremely efficient.

Improved and more efficient spot welding

It is not just the reproducibility of the spot welds that plays a significant role in quality and economy; flexibility and speed are just as important. Our servo-pneumatic drive and control system provides highly precise open- and closed-loop control of welding guns.

Top quality, improved reproducibility

The position and force control helps to increase the quality and reproducibility of spot welds by ruling out rebound impact.

The spot weld can be made with a customised force. The innovative control concept guarantees forces of up to 24 kN. Unlike electrical systems, the forces are available from the first spot weld onwards – at a much lower price.

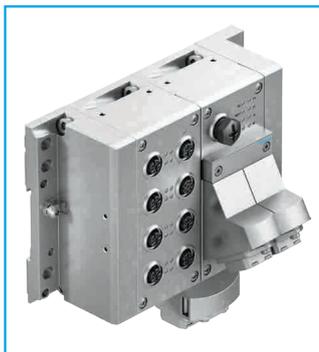
Optimum cycle times

When working around protruding edges, the welding gun no longer has to be fully opened as flexible path curves make for the shortest cycle times.

The new generation of welding guns...

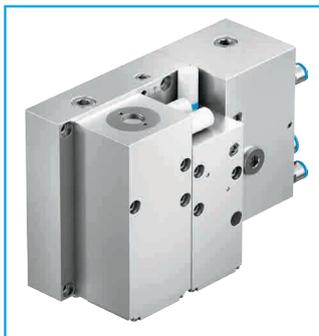
← PROFINET/PROFIBUS/INTERBUS/DeviceNet/EtherNet/IP

The robot control system specifies position and force data as setpoint values.



The welding gun controller

is based on a terminal CPX. It establishes a connection to the higher-order welding controller using various fieldbuses. Opening widths, forces and behaviour can be programmed using the welding gun controller in the event of an error. Point-to-point and 7th axis actuation are possible.



The control block

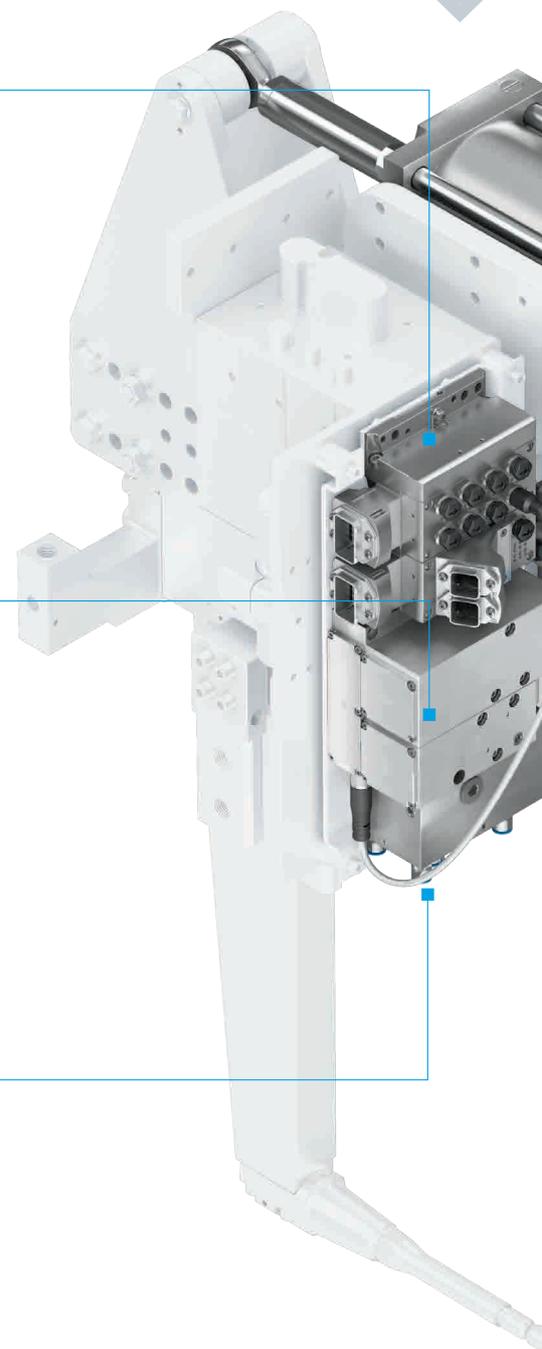
consists of a sub-base, proportional valves and various manifold block variants.

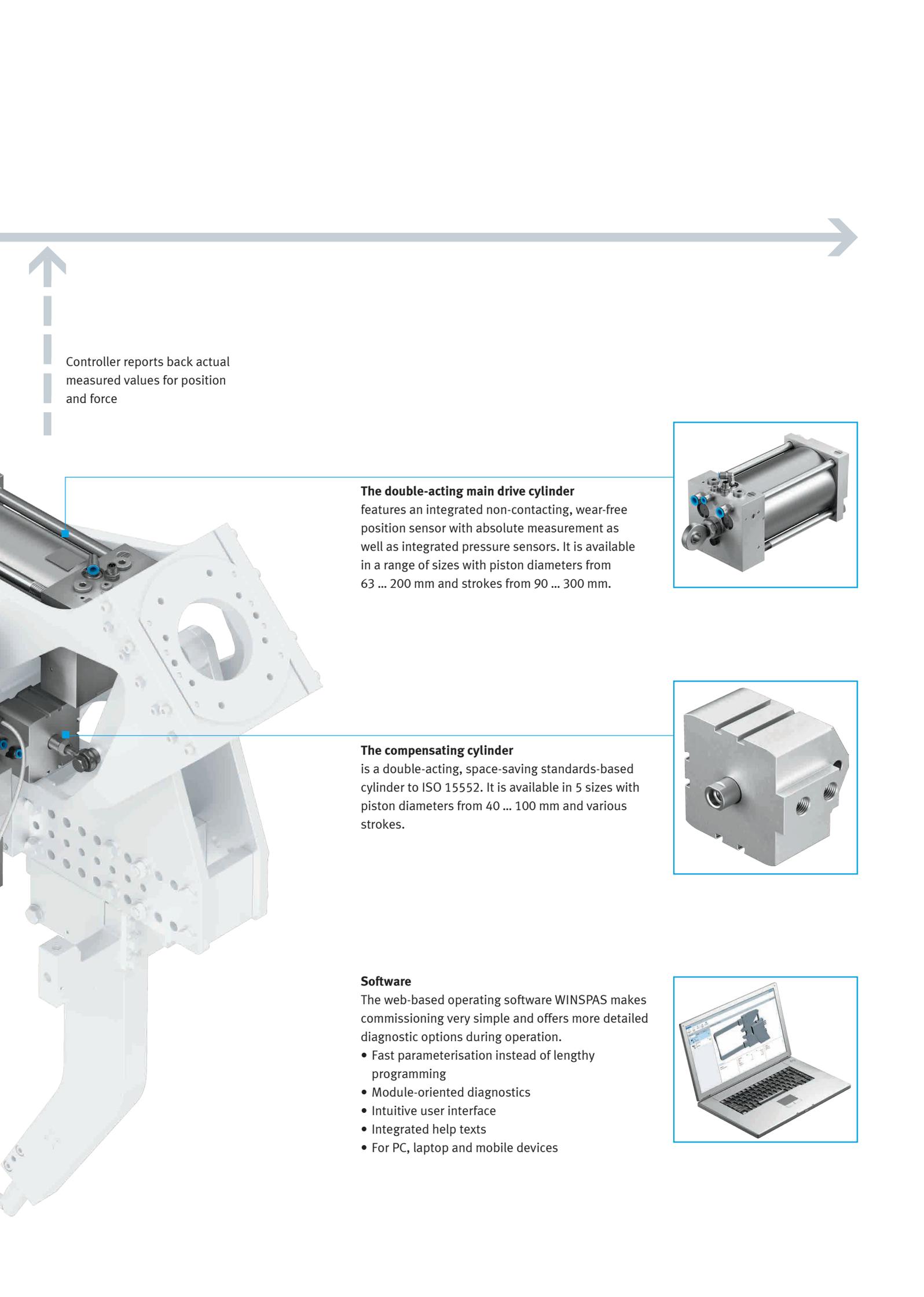
- Closed-loop position and force control for the main drive cylinder
- Closed-loop differential pressure control for the compensating cylinder
- Optional functions: trapping the cylinder air, air-saving system, 5 µm filter



Matching accessories

like cabling and welding-spatter resistant tubing.





Controller reports back actual measured values for position and force

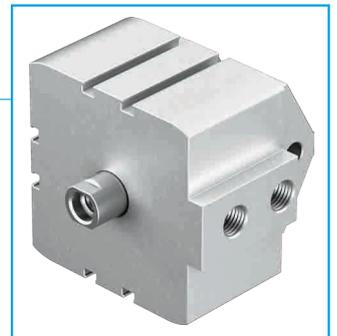
The double-acting main drive cylinder

features an integrated non-contacting, wear-free position sensor with absolute measurement as well as integrated pressure sensors. It is available in a range of sizes with piston diameters from 63 ... 200 mm and strokes from 90 ... 300 mm.



The compensating cylinder

is a double-acting, space-saving standards-based cylinder to ISO 15552. It is available in 5 sizes with piston diameters from 40 ... 100 mm and various strokes.



Software

The web-based operating software WINSPAS makes commissioning very simple and offers more detailed diagnostic options during operation.

- Fast parameterisation instead of lengthy programming
- Module-oriented diagnostics
- Intuitive user interface
- Integrated help texts
- For PC, laptop and mobile devices



... The benefits to you

- +** Internally located valve electronics provide better protection against environmental influences
- +** The use of just 2 cable connections reduces the risk of getting caught
- +** 40% smaller envelope: highly integrated functions result in smaller volume and lower weight
- +** Intelligent components with digital parts on the inside: the relevant data is permanently stored on the chip
- +** Modular structure: components can be mounted in combination or separately from each other
- +** Simple replacement concept: the separate pneumatic connecting plate and screws accessible from above make maintaining each individual component especially quick and easy

Communication components for conditioning monitoring and improved process reliability

The data provided by the intelligent system components enable the processes to be monitored and mapped in line with Industry 4.0.

Extremely easy commissioning thanks to bidirectional communication

Each component has an electronic rating plate so it can be clearly identified during commissioning and for condition monitoring during operation. Bus communication between the components ensures that the controller can exchange data with the higher-order controller.

During commissioning, the welding gun controller detects all connected components on the basis of their transmitted properties. For a cylinder, these include the type, stroke length, diameter and displacement encoder type. This means that manual entry of parameter data can be almost eliminated – commissioning doesn't get any easier!

Lifelong data acquisition for maximum process reliability

The entire life cycle of the components is permanently saved in each component and can be evaluated if necessary. Operating data such as number of kilometres, number of strokes, number of spot welds and date of initial commissioning are recorded and errors are stored (black box function). The digitised valves monitor their condition with regard to temperature and friction. The result is predictive maintenance that improves system and machine availability. A detailed

error report for an individual component can, for example, also be output so as not to lose time during troubleshooting and fault elimination. User-specific communication protocols can be implemented.

Technical data	
Product weight of overall system [g]	1,180
Design	<ul style="list-style-type: none"> • Welding gun controller • Control block • Double-acting main drive cylinder with integrated displacement encoder and pressure sensors for C and X guns • Compensating cylinder
Theoretical force at 10 bar, advancing [N]	5,700; 7,000; 11,000; 14,000
Electrical connection	Cable with plug, round design, M12, 4-pin
Cable length [m]	1.1
Service kits available	Yes
Other features	Integrated shut-off valves (locking air in the cylinder), air filter and exhaust valves (energy-free during maintenance)
Standard flow rate of control block [l/min]	Valve for main drive cylinder: 2,000 Valve for compensating cylinder: 350
Valve function of control block	Piston spool, 5/3-way proportional directional control valve, mid-position closed
Electrical data, voltage range (load/operation) [V DC]	24 +/-10%

Operating and environmental conditions	
Degree of protection	IP65, PWIS-free *
Safety classification	PL (d) Cat. III
Operating pressure [bar]	Max. 12
Nominal pressure [bar]	6 ... 10
Permissible gauge pressure [bar]	16 for max. 1 s

*) All connections must be sealed with appropriate protective caps. The unused PROFINET connections must be sealed with appropriate plugs.

Services for servo-pneumatic welding guns

Solutions to rising cost pressure

Cost pressure in the automotive industry is rising at an increasing rate. With its drive solutions for welding guns, Festo as a partner to the automotive industry offers a technology that helps to mitigate this cost pressure. Good technology and clever solutions further enhance the strengths of our technology.

To achieve this, welding guns need to be able to meet ever increasing requirements – as early as commissioning, but above all during operation. We make sure that we reduce your costs with shorter commissioning times and flawlessly functioning welding guns. Your employees can significantly increase the quality of the welding process and the availability of the welding guns through optimum operation and maintenance. Our services help your employees to get to grips with the welding guns right from the beginning, thus minimising downtimes.

Perfect integration

Festo supports you with every aspect of fast and reliable integration of the welding gun into the higher-level production system.

Ready for immediate use with perfect results

Our specialists optimally configure the welding guns and take care of parameterisation and precision adjustment. This ensures the best possible welding results, optimum cycle times and stable processes for maximum production output and quality.

Know-how for you

Our training courses build on many years of valuable, applied knowledge and pass on that knowledge. We train your operators and maintenance

staff in how to professionally commission, operate and maintain the welding guns.

Repair due? We are there for you!

Festo will also repair the drive system for your servo-pneumatic welding gun. And at attractive terms thanks to the predefined repair and service kits.

Competency worldwide

Wherever your production is based, Festo national companies in over 60 countries guarantee global availability of know-how, support and spare parts.

The right service package from Festo



Commissioning

“Parameterisation and calibration”

- Checking/updating firmware
- Parameterising basic parameters
- Calibrating distance
- Calibrating force
- Setting acceleration
- Backing up parameterisation data
- On request: checking force build-up

“Interface configuration support”

- Support for initial robot interface configuration
- Optional: optimisation of the entire system, e.g. minimising sheet metal stress, force build-up, cycle times, etc.

Training

Basic training

- Fundamentals of servo-pneumatics
- Design of welding guns and basic components
- Commissioning
- Error diagnostics
- Practical exercises with welding guns

Expert training

- Advanced and extended software functions
- Setting up the robot interface
- Parameterising the controller
- Advanced diagnostic functions
- Comprehensive practical exercises

Further services for commissioning X and C guns as well as customised training packages on request