



WITH PRESS-FORCE OF UP TO 300KN

#### THE ELECTROMECHANICAL SYSTEM

Stroke, speed, force, precision and life cycle are the most important characteristics of the system



Active control is guaranteed on 100% of production by the *Press-Right* system, a tool designed by Alfamatic to supervise the press operation in a simple and effective way.

In the electric version, the cylinder is the heart of the system, capable of generating a force from 0.05 kN up to 300 kN.

Precise, fast, strong, and durable, the cylinder consists of a motor and a nut with satellite roller technology – the best state-of-the-art solution – which allows performing the most demanding operations with hundredth-of-a-millimeter precision.



### The electric cylinders and presses are used in various industrial processes, like:

















Bending

Deep drawing





Assembly

Clinching

Trimming







-1-







Press-fit

Marking

Straightening

Riveting

Pressing

Cutting

Compressing

#### THE BENEFITS OF THE SYSTEM



Being a press and not just a linear actuator, there are built-in sensors that enable the complete and accurate control of the pressing operations.

The physical dimensions controlled are **force** and position. The force is measured by a load cell and the **position** is detected by an absolute encoder.

Advantages:

#### Maximum efficiency

Energy consumption is limited to the actual working phase, resulting in a drastic reduction in waste.

#### Reduced maintenance costs

Thanks to the design and high quality of the components, maintenance is minimal. Only periodic lubrication with grease is required.

#### Long durability

The satellite roller screw is the ideal solution for presses: it is designed to last over time and withstand the application of high loads, often at the same point and due to collisions. All the solutions used are aimed at ensuring exceptional resistance to stresses.

#### Application flexibility

Possibility to program complex and articulated working cycles.

The processing parameters are stored in the tool and are independent of the operator's skills.

#### Precision at the stopping point

Active position and speed control allows for great precision in reaching the programmed stopping point.

#### Cleanliness

There is no external contamination from hydraulic oil or air contamination, ensuring a clean and safe working environment.

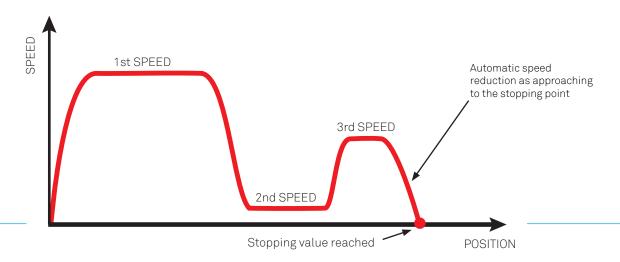
#### Reduced cycle time

The total stroke of the cylinder can be adjusted based on the specific characteristics of the component to be processed. This allows for a significant reduction in cycle time.

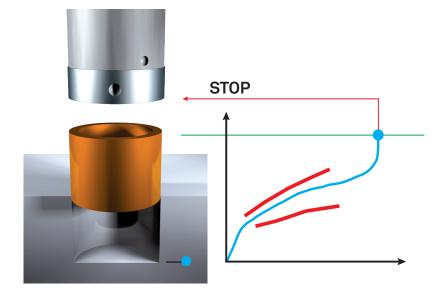
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#### PRODUCTION MANAGEMENT AND CONTROL

- The Alfamatic electric presses use the Press-Right control tool.
- Press-Right enables precise and efficient processing.
- Feedback from the force transducers (load cell) and position transducers (absolute encoder) allows real-time adjustment of the cylinder's speed.



The cylinder speed follows a 3-phase profile with 3 different speeds.



Alfamatic presses are designed to achieve the most precise possible pressing cycle stop:

## • Force Stop Precision with Feedback Thanks to the closed-loop feedback, the press reduces speed as it approaches the programmed value and stops with extreme precision.

# • Maintaining the Programmed Force The cylinder's position is continuously adjusted to keep the applied force constant. The cylinder retracts if the force exceeds the desired value and advances if the force drops below the programmed value.

• Stop Precision with Deformation Recovery
The system continuously calculates the cylinder's position, accounting for structural deformation, ensuring a precise and reliable final position.

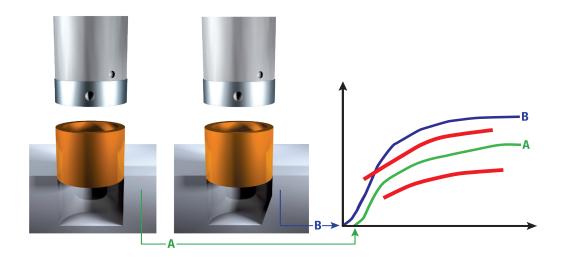
#### **CONTROL WITH BAND AND ITS ADVANTAGES**



The band control ensures the monitoring of the force curve measured at every point.

This system avoids uncertainties arising from the use of discrete windows, which leave uncontrolled areas, thus ensuring complete and precise control of the process.

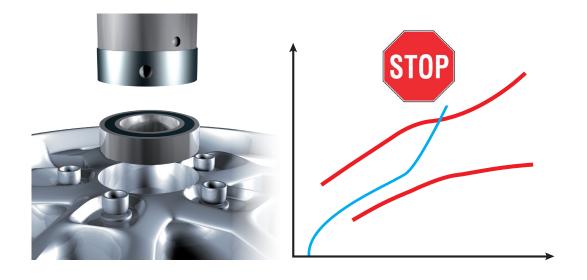
It is still possible to obtain specific values using checkpoints, where the position or force can be measured at predefined points.



### Geometric check on the piece

The points that determine the measured curve depend on the geometric characteristics of the part being processed.

Any geometric errors of the piece are highlighted by non-compliant press curves.



### Non-destructive measurement

For large and expensive parts.

The cycle stops whenever the monitoring curve goes outside the tolerance band. As the check takes place in real time, it preserves the integrity of the piece.

#### FLEXIBILITY AND PRECISION

#### Relative Quotes

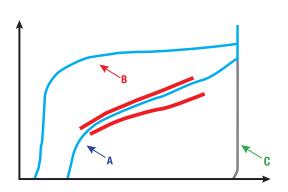
The working parameters can be automatically set referring to the contact point between the tool and the piece, regardless of the dimensional tolerances. When dealing with parts of varying height, the post-process control parameters for the planting process are identified and adjusted according to the measured height at the end of the operation.

#### Checking the contact point

Checking the contact point allows the interruption of the cycles, should the piece be missing or poorly positioned.









#### Differentiated External Load Cell

The high-sensitivity external load cell (code HPT) allows for precise measurements of low forces, expanding the versatility of Alfamatic cylinders.

With an HPT load cell on a 100 kN thrust SA100 cylinder, it is possible to work with just a few dozen Newtons: Press-Right automatically selects the internal or external load cell without interruptions.

Thanks to this, the cylinder's versatility is greatly extended: a single press can be used for multiple applications with varying force requirements.



#### External micrometric probe

The use of an external probe allows micrometric precise measurement of the real position of the tool compared to a reference point on the piece.

This eliminates all the inaccuracies due to clearances and deformations of the structure. Thanks to the peculiarity of the system, it is possible to regulate the cylinder speed in real time, reaching a programmed position at zero speed.

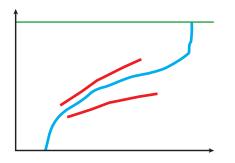


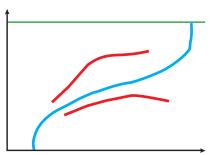
#### Management of work by phases

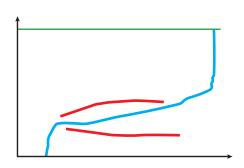
The instrument makes it possible to breakdown every job into several phases. This allows for the execution of complex tasks that require multiple pressing cycles in sequence. The tool can manage up to eight phases, each with its own speed profile and entirely independent parameters.

Each phase can be repeated multiple times, further increasing the machine's flexibility.

The management of the multi-phase cycle becomes even more efficient with the use of the external precision load cell (code HPT): in this case, it is possible to alternate phases requiring high forces with phases requiring very low forces in sequence.







Phase 1

Phase 2

Phase 3



### Determining fracture values

The active check on the position allows precise measurement of force and height values at the time of fracture



### Check on elastic elements

From the curve measured, it is possible to determine the correspondence of the elastic element with the project specifications.

#### **Production Process Management**

Efficient management of the production process is ensured by the ability to connect various devices and sensors, including piece presence sensors, piece locking systems, equipment recognition via RFID technology, pick-to-light systems, USB ports for barcode scanners, and more.

#### THE CYLINDER AND ITS COMPONENTS

#### Transmission group

Made up of drive and conduct pulleys, connected by an inclined teeth belt.
The fine pitch of the roller screw allows the assembly without speed reducer, benefiting reliability, noise and performance.
The special inclined teeth belt

The special inclined teeth belt guarantees:

- silence
- low vibrations

### Load cell built into the actuator

This works in compression and in traction, and it is based on strain gauge technology. It guarantees the following advantages:

- improved linearity and precision in the measurement of static and dynamic forces
- precision with any force profile
- increased immunity to electromagnetic interference.

#### Anti-rotation stem

The cylinder stem is chromiumplated internally and externally, with substantial reduction of the radial clearance and improved resistance to wear and tear. Equipped with integrated anti-rotation device.



### Brushless motor with absolute encoder

The best solution for:

- torque curves
- no maintenance
- dimension-to-power ratio

The absolute encoder keeps the cylinder position constantly in the memory (NO zero search): the cylinder is immediately ready to go.

#### Planetary roller screw

Designed specifically to resist high loads for millions of circles, this is the best choice for heavy-duty press applications.

- Improved durability, even under harsh conditions of use.
- Improved shock resistance.
- Reduced external dimensions.



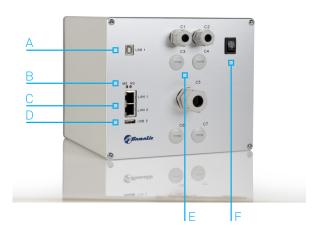


#### **Press-Right**

Press-Right is a measurement system that provides 100% quality control on the manufacturing process.

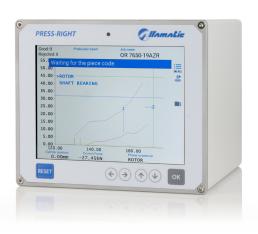
Interfaced to a position transducer and a force transducer, it continuously monitors the position force curve and verifies the

continuously monitors the position/force curve and verifies that it stays within a purposely positioned continuous control range. The system architecture is based on a multiprocessor for data monitoring and analysis and is connected directly to the sensors. The instrument actively controls the movement of the motor, promptly controlling the force and position values.



#### Rear panel

- A USB Port
- B Fieldbus Connection
- C nr.2 Ethernet Ports
- D USB Host Port for BARCODE Scanner
- E Direct Connections to Sensors and Utilities
- F ON/OFF switch



#### SD memory card

An SD memory card allows to memorize the working curves, which can then be displayed and analysed using  ${\rm WinScope}_{\odot}$  software.

The program is included in the supply package. The instrument also has an internal memory, able to store more than one hundred different types of process.

#### I/O operation

The instrument can be managed using simple ON/OFF digital signals and it is easy to integrate with any controller.

#### Fieldbus

For complete control of the cylinder and the measured data, the instrument uses industrial fieldbus protocols, which allow communication with a PLC or with supervision software (SCADA). The following interfaces are available:

- Modbus TCP
- PROFINET (optional)
- EtherNet / IP (optional)

#### Servo drive

To drive the brushless motor of the cylinder and have an extremely high performance it is necessary to feed the phases, taking into consideration the angular position of the shaft.

This job is performed by the servo drive.

The servo drive also controls the position of the cylinder, preventing movements beyond the maximum stroke.

The configuration and the various regulations of the servo drive are programmed in the factory by Alfamatic.

The movement is fully controlled by the Press-Right instrument.

No special skills or abilities are required for the configuration of the servo drive, hugely simplifying the use of the Alfamatic system.



#### THE COMMAND AND CONTROL CHAIN

### The synergy between servo-drive and electronics is essential.

The control system has been specifically designed for pressing operations and leverages Alfamatic's experience, which began in 1992 with the first electronic tools for force and position control.

Alfamatic provides a ready-to-install kit complete with a mounting frame, electrical cabinet, and pre-wired tool.

WinScope® and Autocopy program

PLC

#### **Press-Right**

It controls the force and instantaneous position of the cylinder in real time.

It shows the working curve and checks that it stays within pre-set parameters.

It is delivered already configured for the cylinder to which it will be connected and already calibrated with one of our certified Accredia instruments.

#### Servodrive

It drives the brushless motor of the cylinder and manages the position of the piston rod.

Equipped with STO safety inputs. No braking resistor is required. It is delivered pre-configured and ready for use.

#### **Electric cylinder SA**

A planetary roller nut on a spindle screw converts the rotary motion of the motor into linear motion.

The cylinder houses a load cell and an absolute encoder, for measuring the force and the position of the press stem in the cylinder

The anti-rotation of the stem is integrated.



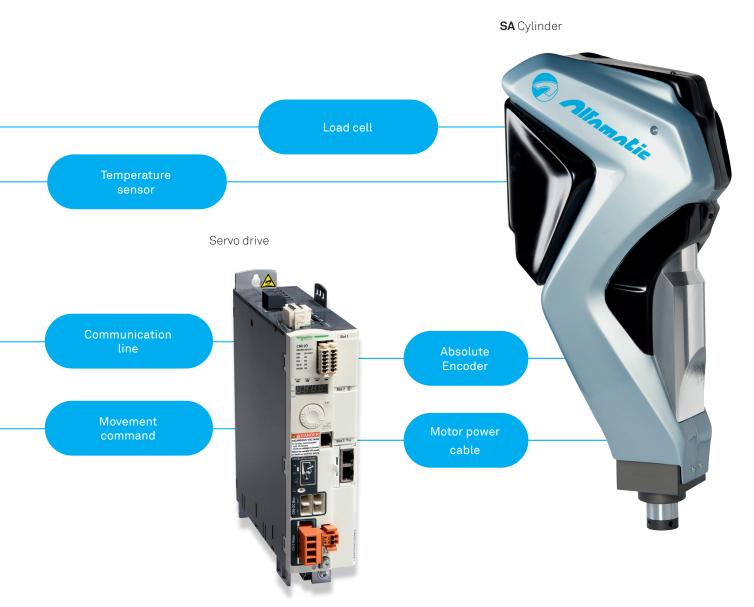
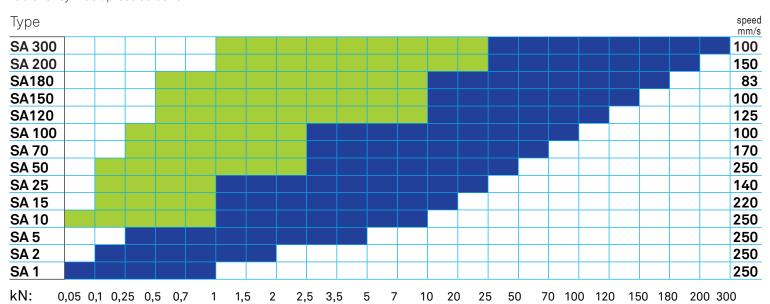


Table for cylinder/press selection



In the table, in blue, the operating range for standard models (with internal force transducer) is indicated. In green, the operating range with the differentiated external force transducer (optional, code HPT) is indicated.

#### THE CYLINDER RANGE

### Model SA 10 - 15 - 25

The models SA 10 - 15 - 25 use the same structure and size of the model with the highest force.

The force and the maximum speed of the cylinder depend on the different transmission ratio.

This allows the modification of the press characteristics after purchase.

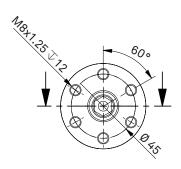
The operation involves only the replacement of the load cell and the transmission group.

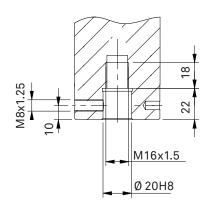




#### **Technical features**

	SA 10	SA 15	SA 25		
Maximum force	10 kN	15 kN	25 kN		
Maximum speed	250 mm/s	220 mm/s	140 mm/s		
Repeatability with a constant load		±0,01 mm			
Precision of force measured	0,5% F.S.				
Stroke	300 mm				
Absorbed power	3.3 kW				
Voltage	400V trifase 50/60Hz				
Weight	45 kg				
Ambient temperature	10 40 °C				
Relative air humidity	90% (no condensation allowed)				
Precision of the anti-rotation system	em 0.7°				



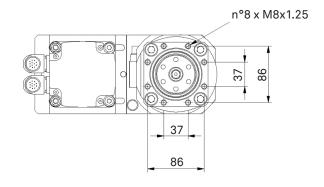


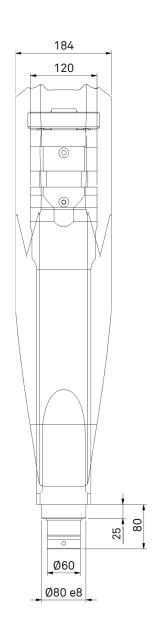


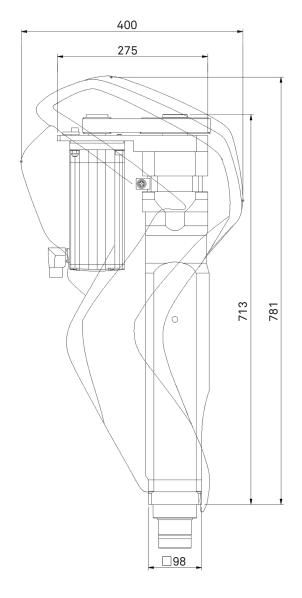
#### Fixing data **SA 10 - 15 - 25**

Screw	M8 x 1.25
Minimum length screwed	16 mm
Hole depth	25 mm
Tightening torque (*)	16 Nm

<sup>\*</sup> minimum resistance class 8.8







#### THE CYLINDER RANGE

### Model SA 50 - 70 - 100

The models SA 50 - 70 - 100 share the same structure, sized on the model with the highest force.

The force and the maximum speed of the cylinder depend on the different transmission ratio.

This allows the modification of the press characteristics after purchase.

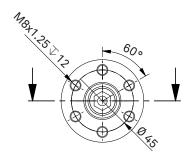
The operation involves only the replacement of the transmission group.

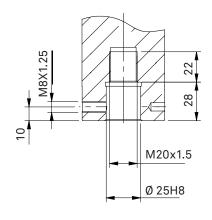




#### Technical features

	SA 50	SA 70	SA 100		
Maximum force	50 kN	70 kN	100 kN		
Maximum speed	250 mm/s	180 mm/s	100 mm/s		
Repeatability with a constant load	±0,01 mm	±0,01 mm	±0,01 mm		
Precision of force measured	1% F.S.	0,7% F.S.	0,5% F.S.		
Stroke	250 mm				
Absorbed power	5 kW				
Voltage	400V trifase 50/60Hz				
Weight	75 kg				
Ambient temperature	10 40 °C				
Relative air humidity	90% (no condensation allowed)				
Precision of the anti-rotation system	n 0.7°				



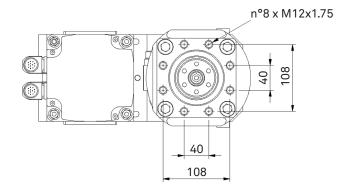


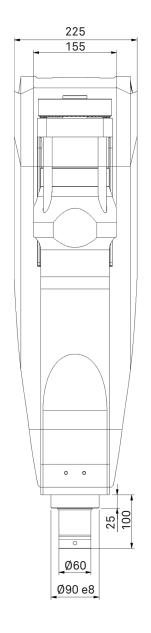


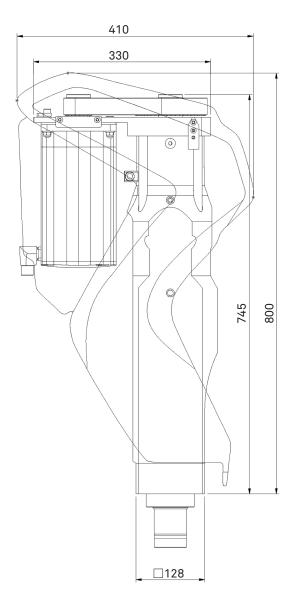
#### Fixing data SA 50 - 70 - 100

Screw	M12 x 1.75
Minimum length screwed	20 mm
Hole depth	24 mm
Tightening torque (*)	40 Nm

<sup>\*</sup> minimum resistance class 8.8







#### THE CYLINDER RANGE

### Model SA 120 - 150 - 180

The models SA 120 - 150 - 180 share the same structure, sized on the model with the highest force.

The force and the maximum speed of the cylinder depend on the different transmission ratio.

This allows the modification of the press characteristics after purchase.

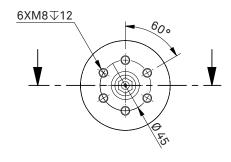
The operation involves only the replacement of the transmission group.

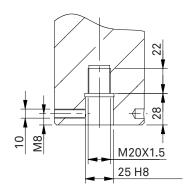




#### **Technical features**

	SA 120	SA 150	SA 180		
Maximum force	120 kN	150 kN	180 kN		
Maximum speed	125 mm/s	100 mm/s	83 mm/s		
Repeatability with a constant load	±0,01 mm	±0,01 mm	±0,01 mm		
Precision of force measured	0,7% F.S.				
Stroke	250/420 mm				
Absorbed power	11 kW				
Voltage	400V trifase 50/60Hz				
Weight	230 kg				
Ambient temperature	10 40 °C				
Relative air humidity	90% (non ammessa condensa)				
Precision of the anti-rotation system	n 1º				



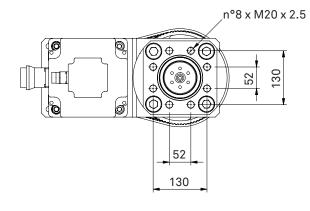


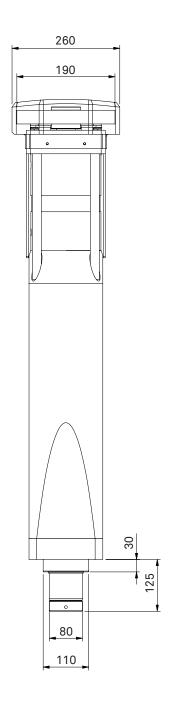


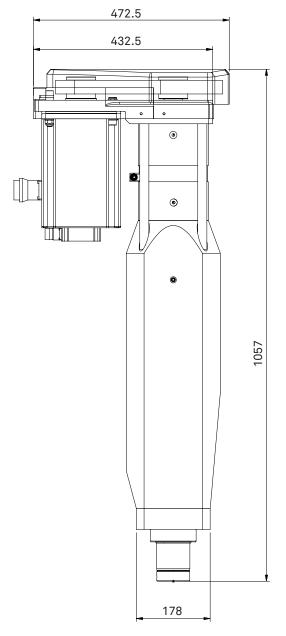
#### Fixing data SA 120 - 150 - 180

Screw	M20 x 2.5
Minimum length screwed	25 mm
Hole depth	30 mm
Tightening torque (*)	260 Nm

<sup>\*</sup> minimum resistance class 8.8







#### THE CYLINDER RANGE

### Model SA 200 - 300

The SA 200 - 300 models use the same structure, sized for the model of greater strength.

The maximum force and speed of the cylinder depend on the different transmission ratio.

This allows the modification of the press characteristics after purchase.

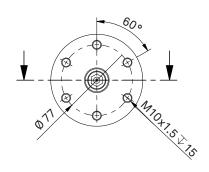
The operation involves only the replacement of the load cell and transmission unit.

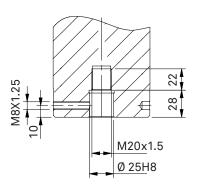




#### Technical features

	SA 200	SA 300		
Maximum force	200 kN	300 kN		
Maximum speed	150 mm/s	100 mm/s		
Repeatability with a constant load	±0,01 mm			
Precision of force measured	0,5% F.S.			
Stroke	420 mm			
Absorbed power	11 kW			
Voltage	400V trifase 50/60Hz			
Weight	330 kg			
Ambient temperature	10 40 °C			
Relative air humidity	90% (no condensation allowed)			
Precision of the anti-rotation system	ystem c. a. 1°			



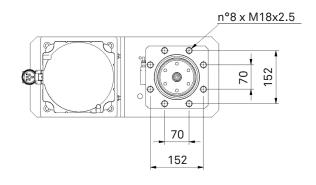


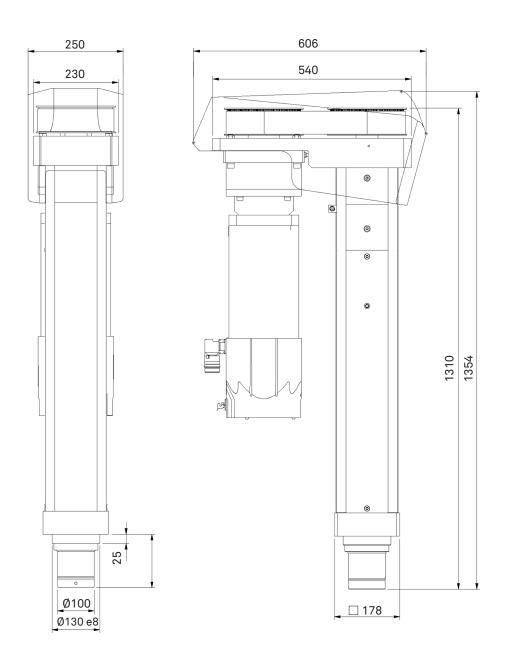


#### Fixing data SA 200 - 300

Screw	M18 x 2.5
Minimum length screwed	20 mm
Hole depth	30 mm
Tightening torque (*)	140 Nm

<sup>\*</sup> minimum resistance class 9.8





#### THE CYLINDER RANGE

### Model SA 1P - 2P - 5P

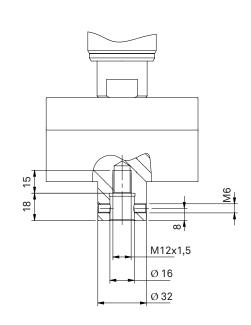
The SA 1P, 2P, and 5P models use a ball screw and have the load cell mounted at the end of the piston rod.





#### **Technical features**

	SA 1P	SA 2P	SA 5P	
Maximum force	1 kN	2 kN	5 kN	
Maximum speed	250 mm/s	250 mm/s	250 mm/s	
Repeatability with a constant load		0,04 mm		
Precision of force measured	0,5% F.S.			
Stroke	280 mm			
Absorbed power	1 kW	1 kW	1,6 kW	
Voltage	230V monofase 50/60Hz			
Weight	13 kg	15 kg	20 kg	
Ambient temperature	10 40 °C			
Relative air humidity	90% (no condensation allowed)			

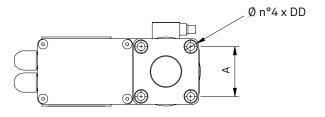


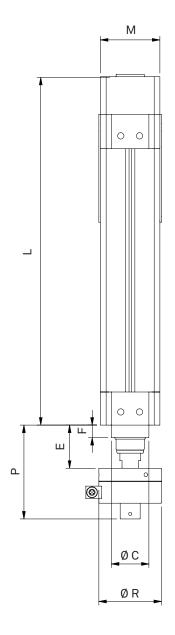


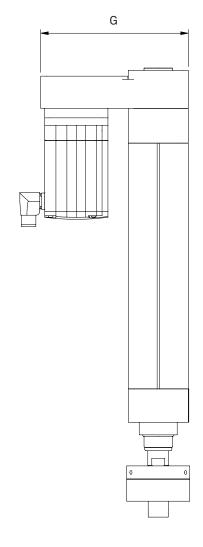
	Α	ØС	Ε	F	G	L	М	Р	ØR
SA 1	32.5	30	32	12	126	480.5	46.5	105	100
SA2	46.5	40	57	16	160	494	63.5	132	100
SA5	72	60	69	20	233.5	557	95	150	100

#### Fixing data SA 1 ... 5P

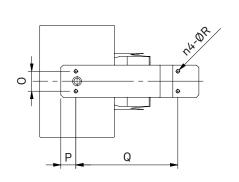
	SA 1P	SA 2P	SA 5P
А	32.5 mm	46.5 mm	72 mm
DD Type of screws	M6 x 1	M8 x 1.25	M10 x 1.5
Hole depth	10 mm	22 mm	25 mm
Tightening torque	8 Nm	16 Nm	34 Nm



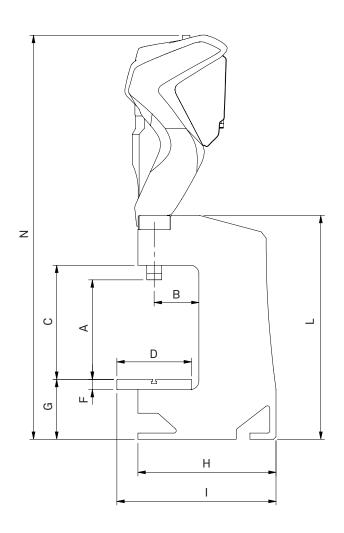


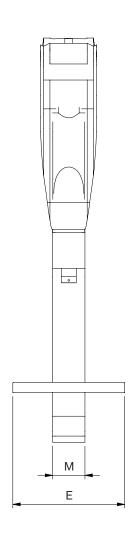


### C-FRAME (STRUCTURE ONLY)









	Α	В	С	D	E	F	G	Н	I	L	М	N	0	Р	Q	R
MP 10-15-25	360	150	394	250	350	31	191	442	517	745	100	1475	60	60	322	Ø13
MP 50-70-100	400	180	459	300	450	41	241	554,5	640	900	130	1624	80	60	410	Ø15





#### **Electric cabinet**

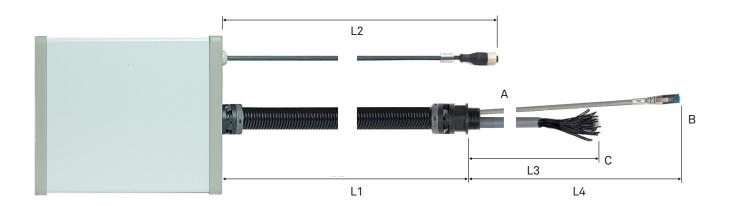
Pre-wired, containing:

- Drive unit
- General on-off switch with door lock
- Magnetic thermal protection switches
- Redundant power supply switches
- Cooling system
- Terminal block for connection to main panel

#### **Pre-wiring option**

The pre-wired version of the Press-Right tool simplifies and speeds up the press installation, reducing the time required for wiring and configuring the electrical components. The pre-wiring eliminates the time needed for wiring the tool and reduces the risk of errors, improving the overall reliability of the system and ensuring a faster and safer installation.

	L1	L2	L3	L4
PRECAB 025	2.5 m	2.8 m	1.4 m	1.9 m
PRECAB 120	12 m	4.6 m	1.4 m	1.9 m



#### **ACCESSORIES**



#### Lubricating grease

Lubricating grease specific for presses with ball and satellite roller screws.

**Grease Pump**Enables the addition of grease through the grease bore into the nut of the electric actuator.





Bicolor Light Illuminates the work area with white light for better visibility. In case of a noncompliant part, the light turns red.



#### Access-ready area lighting.

A visual device signals the press at rest and the accessibility to the work area. A luminous device signals the press at rest and and access to the work area. This avoids the press lock caused by accidental access to the area during the press stem motion.

#### **ACCESSORIES**



#### **HPT Load Cell**

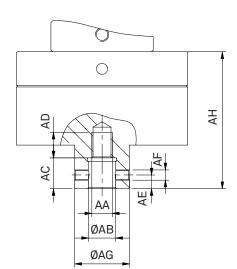
The external HPT load cell allows for the precise measurement of low forces, further extending the versatility of Alfamatic electric cylinders. Thanks to this additional load cell, accurate data can be obtained even for applications that require the measurement of very low forces, thereby improving the control of the pressing process.

The integration of the HPT load cell into the electric cylinders allows for the management of a wide range of operations with varying force requirements. The press is therefore ideal for applications ranging from micro-pressing to operations that require very high forces. With the HPT system, Press-Right automatically selects the best load cell for the measurement being performed, switching between cells in real-time during the pressing process.

This enables highly precise work across the entire force range.



	HPT 1	HPT 2	HPT 20
Compatibility	SA 10 25	SA 10 100	SA 200 300
Nominal Load in Compression	1 kN	2 kN	20 kN
Maximum Error	4 N	8 N	40 N
Maximum Load in Tension	100 N	200 N	2000 N
Tensile Breaking Load	2 kN	4 kN	50 kN
Resolution	1 N	2 N	20 N



	AA	AB	AC	AD	ΑE	AF*	AG	АН
HPT 1 2	M12 x 1.5	Ø 16 H8	18	15	8	2 x M6	Ø32	80
HPT 20	M20 x 1.5	Ø 25 H8	28	22	15	2 x M10	Ø 60	117

<sup>\* =</sup> Unoriented holes

#### **ACCESSORIES**

#### **SOFTWARE**

From the Alfamatic website, it is possible to download free programs to extend the functionality of the Press-Right tool.

#### WINSCOPE

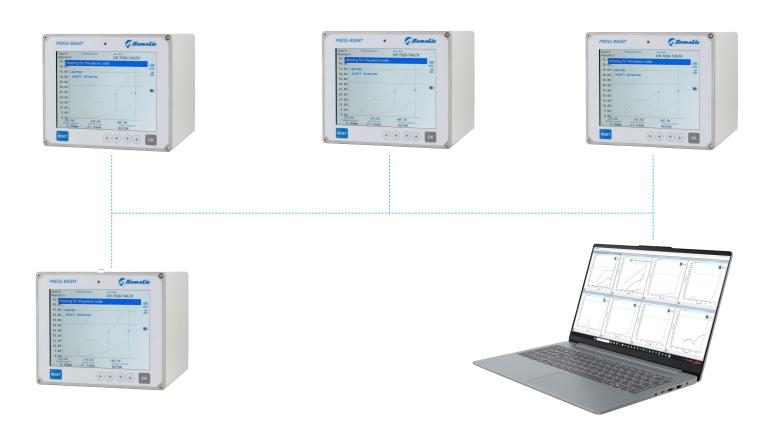
The electric cylinders and presses are equipped with the instrument Press-Right. They are a stand-alone system and do not require the use of a computer. The programming and control functions are performed by the instrument in a clear and simple way. However, the occasional or continuing use of a computer connected to the instrument can add some functions to the system. The WinScope® programme is supplied for this purpose.

#### Central management

With WinScope  $_{\tiny{\textcircled{\tiny \$}}}$  it is possible to simultaneously monitor, control, programming and archiving of the data of several presses from a single computer.

#### Backup

WinScope® allows for backing up the tool's memory, ensuring the safety of the stored data.



#### **AUTOCOPY**

Autocopy is a program that automatically transfers the curves stored in the tool via an etwork connection. In addition to transferring curves viewable with WinScope®, it can create files in CSV format. Autocopy is designed to communicate with multiple tools simultaneously. Running on a computer connected to the tool network, it monitors all the tools and, when a new curve is available, transfers it to a network folder.

#### **Tracking**

By entering data such as the order number and part serial number before the work begins, Autocopy will organize the curve storage into folders and use the serial number as the file name, allowing for easy traceability of the production process.

### NOTE





Pneumo-hydraulic presses



Manually operated pneumo-hydraulic presses



Pressing process control systems



Pneumo-hydraulic cylinder



Air-Oil Booster



**Electric presses** 



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