Hydraulic ALLrounderS

Injection moulding machines
for diverse applications
At a glance

Powerful, reliable injection moulding machines, “Made by ARBURG – Made in Germany”: this is what our hydraulic ALLROUNDERs stand for. The machines range from the low-cost entry level models of the GOLDEN EDITION series to the individually adaptable ALLROUNDER S series. Our modular design approach opens up a whole range of cost-efficient options with several alternative hydraulic and electric expansion stages as well as various equipment versions.

Thanks to their adaptability, the hydraulic ALLROUNDERs not only offer a wide variety of different applications, but can also be equipped in an extremely energy-efficient manner.

You specify your requirements and we build a suitable hydraulic ALLROUNDER. Especially for you.

Wide variety of combination options: modular equipment for optimum customised solutions

<table>
<thead>
<tr>
<th>Distance between tie bars [mm]</th>
<th>Clamping forces [kN]</th>
<th>Injection units according to EUROMAP</th>
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Shot weight [g PS]

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<th>Shot weight [g PS]</th>
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<th>Dual-circuit pump technology</th>
<th>Hydraulic accumulator technology</th>
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Cost efficiency: unbeatable price/performance ratio.

Diverse applications: hydraulic options ensure short dry-cycle times.
Diverse applications
Hydraulic ALLROUNDER machines can be optimally adapted for operation in conjunction with all familiar injection moulding techniques. They impress, not only with their large range of sizes, but also due to the ease of integration of various peripherals via the freely programmable SELOGICA control system. Equipment packages for specific tasks make the hydraulic machine concept exceptionally flexible and universal. For example, the ALLROUNDER S machine series allows you to:
• individually adapt the power of the drive technology
• overmould inserts or inject into the parting line by means of the ALLROUNDER principle with swivelling clamping unit and interchangeable injection unit
• implement linear mould filling thanks to the VARIO principle with horizontal free-sliding injection unit.

Cost efficiency
The ALLROUNDER GOLDEN EDITION is the entry-level model in the hydraulic product range. Its unbeatable price/performance ratio is achieved through the consistent standardisation of the extensive, technically advanced basic equipment. Two-circuit pump technology and fast-switching valve technology are provided as standard, for example.

Individuality
The hydraulic ALLROUNDERs can be adapted precisely to the relevant applications and energy requirements. This is achieved by means of several hydraulic versions and electric expansion stages, an extensive clamping force and injection unit range as well as numerous equipment versions and combination options.

Reproducibility
Regulated injection ensures reproducible mould filling and the customary high moulded part quality on all hydraulic ALLROUNDERS. With the “position-regulated screw” option on the ALLROUNDER S machines, injection moulding reproducibility comparable to that of electric machines can be achieved.

Reliability
All hydraulic ALLROUNDER injection moulding machines are high-performance machines featuring quality workmanship. Optimum availability and a long service life are synonymous with the ARBURG name. Proven features include:
• energy-saving oil exchange via the differential piston system in the clamping unit
• high stability of the clamping unit thanks to four-tie-bar guidance
• scratch-resistant, powder-coated machine parts.
Modular machine concepts

1 Versatile drive technology

Whether single-circuit pump technology for energy-saving operation or two-circuit pump and hydraulic accumulator technology for short cycle times and higher performance: the drive systems of the hydraulic ALLROUNDERS can always be adapted to perfection. For increased energy efficiency, speed-controlled pump motors (ARBURG servo-hydraulic or energy-saving system) as well as additional electro-mechanical dosage systems are available.

2 Reliable clamping units

The enormous breadth of the machine size range is reflected in a wider spectrum of applications as well as the reliable operation of the machines. Both high travel speeds and slower movements with high forces are possible. Mould wear is reduced to a minimum thanks to precision guidance of the moving mounting platen. The clamping unit is very easily accessible, allowing fast mould changes.

Our hydraulic ALLROUNDERS offer you injection moulding machines that have been systematically designed to meet your daily production needs. This enables you to achieve customised, cost-effective technical solutions, as well as permitting production at competitive unit prices. Whether as an entry-level GOLDEN EDITION model with clearly defined options or as a highly adaptable, modular ALLROUNDERS: the hydraulic ARBURG machines provide the highest quality and output in many injection moulding plants worldwide. Moreover, they have been doing so for generations.
Adaptable injection units

The machine’s individual adaptability is further enhanced by a large choice of injection units, different screw diameters, wear-resistance categories for cylinder modules and alternative screw geometries, as well as high-performance and hybrid versions. Comprehensive, energy-efficient configurations can also be achieved on the injection side. Further energy-saving potential is provided by the use of electro-mechanical dosage (AED).

Above and beyond the standard injection control, the position-regulated screw option increases the dynamics and precision of the injection process. A hydraulic accumulator enhances injection performance where necessary. These equipment versions consistently ensure high moulded part production quality.

SELOGICA control system

The SELOGICA provides the same operating system for all machine series. The machine cycle features intuitive programming using graphic symbols, enabling short set-up times. Immediate plausibility checking of all parameter entries ensures high operating reliability and convenience. This makes even complex processes easy to understand in the human-machine dialogue.
Versatile drive technology

1 Modular hydraulics

The following hydraulic system versions are available, depending on the area of application:

- Technology stage T1:
  Single-circuit pump technology for serial energy-saving sequences; alternatively with servo-hydraulics (ASH)
- Technology stage T2:
  Two-circuit pump technology for simultaneous movements; alternatively with energy saving system (AES)
- Hydraulic accumulator technology for higher dynamics and speed in the injection moulding process

2 Electric expansion stages

In terms of drives, both electro-mechanical dosage (AED) as well as an electro-mechanical ejector are available on the ALLROUNDER S, which can both be moved completely independently and therefore simultaneously with other movements. In addition to cycle-time and energy savings, its use also enhances precision.
Efficient: productivity package for greater cost-efficiency.

Precise: reproducible injection thanks to valves situated close to the hydraulic consumers.

3 Packages for greater efficiency
On all hydraulic ALLROUNDER machines, the productivity package comprises the AES with a water-cooled rotational-speed-regulated pump motor. Higher rotational speeds are possible as required. The productivity package thus combines low energy requirements with higher pump output, shorter dry cycle times and lower emissions.

On the ALLROUNDER S machines, AES is included in the “advance” equipment package, which also includes electro-mechanical dosage (AED) and the position-regulated screw (PRS). The ALLROUNDER S advance therefore offers high-level reproducibility, energy efficiency and optimised cycle times, combined with an attractive price/performance ratio.

4 Precise control technology
Fast-switching valve technology ensures precise operation combined with low energy consumption. The location of the valve system close to the hydraulic consumers improves control accuracy during injection and dosage. Pressure/volume regulation as standard provides all movements with the necessary dynamics. Precise positioning is achieved by stroke-dependent ramps. The combination of all these features enables precision in all movements and results in perfect moulded part quality.

Overview

ARBURG servo-hydraulic system (ASH)
- Water-cooled, rotational-speed-regulated servo-motor
- No no-load losses: drive stops when movement stops
- Low cooling requirement and noise level
- Energy saving up to 50 percent
- Version for ALLROUNDER S machines

Dual-circuit pump technology
- The cycle time and sequence can be optimised through simultaneous ejector, nozzle or core-pull movements.
- Maximum clamping unit speed, even during simultaneous movements
- Controlled mould locking force throughout the injection moulding cycle
- Standard on GOLDEN EDITION series

ARBURG energy-saving system (AES)
- Water-cooled, rotational-speed-regulated motor
- Minimal no-load losses and reduced cooling requirement and noise level
- Energy saving up to 20 percent

Hydraulic accumulator technology
- All movement axes are servo-regulated and thus fully independent of one another
- Simultaneous and extremely precise movements at high speeds
- Injection on the fly
- High filling dynamics
Reliable clamping units

Good accessibility
The generous tie-bar spacing allows easy handling, even in the case of large moulds. The customisable hole patterns on the clamping platens ensure a high degree of flexibility when using moulds. Moulds are changed quickly and conveniently thanks to the opening at the top of the safety guard, the ejector quick-connect coupling that is standard on all machines, as well as the freely accessible media connections and interfaces on the rear of the machine. For even greater convenience as well as short, safe access to the mould, the media connections can also be routed directly on the fixed or moving mounting platens. The safety guard, which has been specially enlarged towards the rear of the ALLROUNDER S machines, offers ample space for attachments, for operating e.g. unscrewing and indexing units.

Compact design and perfect accessibility are some of the exceptional characteristics that count, making everyday work with the hydraulic ALLROUNDERs easy, safe, reliable and convenient. The more stable the design and construction of the clamping units, the gentler the impact on your moulds. The four-tie-bar guidance system is therefore also used on the GOLDEN EDITION entry-level model. And thanks to ARBURG’s customary practice of ensuring component compatibility, the same moulds can be used on different machines without any problem. For example, on the small ALLROUNDER S machines, standard or insert parts can optionally be produced in various working positions by means of pivoting clamping units. Our hydraulic ALLROUNDER machines are therefore just like your production: highly flexible.

Energy-efficient cylinder system
Wide range of applications
2 Wide range of applications
The large range of machine sizes together with the comprehensive clamping force spectrum allows optimal configurations to be achieved in terms of applications and energy consumption. The automatic mould height adjustment feature on the larger ALLROUNDER S machines permits greater installation heights as well as shorter cycle times and lower energy consumption.

3 Mould protection
The elongated box design of the moving mould mounting platen is supported at several points on the machine base in the case of larger ALLROUNDERs. Together with four-tie-bar guidance, this ensures maximum parallelism and high precision. Optimal mould maintenance periods are assured by the stable clamping unit, the central application of force during movement and locking and the sensitive mould protection system.

4 Energy-efficient cylinder system
The differential piston system developed by ARBURG ensures an effective, energy-saving oil exchange. It also reduces expenditure on machine cooling. With this cylinder system, both high speeds and slow movements can be achieved with high force. Another exceptional feature is the compact design with a small number of sealing points on the outside.
Adaptable injection units

1 Short set-up times
The injection unit can be swivelled to the operator’s side for easy removal and cleaning of the screw and for replacing the cylinder modules. The screw can be removed without dismantling the cylinder module. Set-up can be performed quickly and without errors thanks to the screw’s quick-connect coupling and the central connection of all cylinder module supply units.

2 Wide variety of combinations
The large selection of injection units with a variety of screw diameters ensures perfect and energy-efficient adaptation of the machines to the application at hand. Also available are highly wear-resistant bimetallic cylinders with special geometries. There are also cylinder modules for thermoset and silicone processing for the ALLROUNDER S.

3 Torque-free nozzle contact
The advantage of torque-free, two-tie-bar guidance of the injection units is an absolutely leak-free nozzle contact surface. Both flat and radius nozzles can be used without problem. High nozzle contact forces are reliably achieved thanks to central insertion in the mould. The build-up of the nozzle contact force is programmable and controlled. This has a positive effect on nozzle and mould wear.

To ensure optimum material preparation and injection, the GOLDEN EDITION entry-level model includes adaptable injection units in different sizes and screw diameters. Specially coated screws with special geometries allow you to process all common plastics with the ALLROUNDER S machines. In a vertical set-up, the size 30 to 400 injection units can inject vertically into the parting line. The VARIO principle provides you with additional flexibility: it permits horizontal linear mould filling with a free-sliding injection unit. This broad range of equipment is supplemented by further hydraulic and electric expansion stages, with high-quality part production guaranteed.
4 **Controlled injection**

A closed-loop control circuit as well as a pressure and speed-controlled injection process ensures reproducible mould filling and high-quality moulded parts. The screw is reliably prevented from retracting, ensuring consistent shot weights. With the position-regulated screw developed by ARBURG, moulded part quality from the ALLROUNDER S can be further increased (standard with “advance” equipment package). This is achieved through improved control precision with regard to pressure and speed of injection. A separate, closed-loop control circuit (servo control) for the injection process characterises this feature. The hydraulic accumulator technology provides even greater dynamics and speed during injection.

5 **Expandable dosage drive**

Optional electro-mechanical dosage (AED) on the ALLROUNDER S enables energy savings of up to 20 per cent while maintaining the same high precision. Because the electro-mechanical dosage drive operates independently, cycle times can be significantly reduced in some cases. Simultaneous dosing also permits longer dosage times and hence gentler melt preparation.
SELOGICA control system

1 Central management
The SELOGICA system saves time and costs thanks to its unique standardised operating concept. With the simple integration of a variety of peripherals, the control system can be used for sequence management, even of complete production cells. The management of setting data is simpler than ever; there is only one data set for the entire production unit.

2 Intuitive operation
All data can be accessed immediately, rapidly and easily via the SELOGICA touch-screen. The graphic operating system, which is compatible with a wide variety of technologies, is self-explanatory. The unique sequence editor with patented, real-time plausibility check always clearly indicates the logical position of the current programming step. This way, operating errors are prevented from the start.

Maintaining control over sophisticated machine and robotic technology requires a high-performance control system. All the sub-steps in the manufacturing cycle can be programmed clearly and easily using the intuitive SELOGICA sequence editor. SELOGICA acts as a central setting and monitoring system for the entire injection moulding process, including the programming of integrated robotic systems and peripherals. All technical features of SELOGICA are designed to make operation quick, safe and convenient. In this way, short set-up times can be achieved in your production facility. Data is input consistently and training is kept to a minimum, as your operators no longer have to adapt their thinking process.

Further information:
SELOGICA control system brochure
3 Fast set-up times
The input logic of the SELOGICA system is based on the mould set-up sequence and optimisation of the injection moulding process. The “Set-up Assistant” module supports daily operations from menu-guided mould installation and automatic calculation of the parameters through to teach-in of the finished sequence – no in-depth knowledge required.

4 Reliable optimisation
The SELOGICA machine control system offers numerous options for process optimisation, monitoring and documentation. Numerous mould protection, diagnostic and support functions, such as the maintenance display, all fall under the topic of machine monitoring. All messages are displayed conveniently in plain text, so that operators always know precisely what action has to be taken.

Highlights
• Control centre for the entire injection moulding technology
• Convenient sequence programming with graphic symbols
• Direct plausibility checks
• Common data record for the entire production unit
• “Set-up Assistant” module
• Interactive teach-in functions
• Water-cooling for continuous temperature control in the control cabinet
Application examples

1 Special processes

From gas injection moulding technology and the processing of liquid silicones through to powder injection moulding: the ALLROUNDER S machine series is extremely adaptable thanks to the large range of available options in terms of size, performance and equipment. The ALLROUNDER principle allows a vertical arrangement of the clamping and injection units in order to enable the overmoulding of inserts or injection into the parting line, for example. A good example of this enormous flexibility can be found in clean room applications. With additional equipment such as clean air hoods, water-cooled drive motors and media connections installed on the mounting platen, the ALLROUNDER S machines can be individually adapted to the relevant clean room requirements.

2 Multi-component parts

The modular concept of the ALLROUNDER S machine series is also implemented in the multi-component range. Here, different practice-oriented modules can be combined to provide the ideal machine for any application. All injection units and mould functions are integrated in the central SELOGICA control system. All processing parameters are immediately accessible. Even complex sequences are rendered transparent and smooth production is reliably ensured. In process-engineering terms, all the known multi-component process technologies can be implemented using the ALLROUNDER S machines. Machines with six mutually independent injection units have already been built.

Further information:
Application expertise brochure
Robotic systems brochure
Thermoset processing: special equipment ensures high part quality.

Large parts: shot weights exceeding two kilograms achievable

Automation: ALLROUNDER machines and robotic systems from a single source.

3 Thermoset processing
ARBURG provides a specially tailored thermoset package to enable thermosets to be processed on hydraulic ALLROUNDER S machines. The system solution includes all the necessary features, such as
• three-platen technology with four-tie-bar guidance and central force application, ensuring precise demoulding
• cylinder module with liquid temperature control for precise thermal regulation
• bimetallic cylinder for a long service life
• special screw geometry ensures the material can be processed without damaging the fibres.

4 Micro components through to large parts
Thanks to the wide variety of combination options, hydraulic ALLROUNDER machines cover an enormous range of applications. A machine can be assembled for the production of micro components with a weight of less than 0.1 gram just as it can for the production of large parts with high shot weights or large projected areas. Hydraulic and electric options as well as various equipment versions enable optimum design of the ALLROUNDER S machines in terms of application and energy consumption.

5 Automation
The combination of ALLROUNDER machines and robotic systems forms the basis for complete production cells, which are developed by the ARBURG project department together with the customer. All upstream and downstream production steps in the injection moulding process are automated. The service offerings available from ARBURG covers optimisation of moulded parts and support during the mould design process, complete assembly and commissioning of the individual components and installation at the owner’s premises, plus all the necessary services.
Distance between tie bars from 170 x 170 to 920 x 920 mm | Clamping forces from 125 to 5,000 kN | Injection units from size 30 to 4600 (in accordance with EUROMAP)