AC Progress VP2

Advanced wire electrical discharge machine with high degree of precision and quality
**Highlights**

**High performance and productivity for high tech applications**

*from Ø 0.05 mm to Ø 0.33 mm*

**Thin wire**
To extend the application range of the AC Progress VP systems, an optional kit for using wires with diameters of down to 0.05 mm can be fitted. With this option, shapes requiring an internal radii of just 32 μm can be achieved.

**Smart Threading – threading in small holes in maximum safety**
Using wires with small diameters means that the production parts must have very small initial holes. With the Smart Threading option the minimum threading diameter for wires measuring 0.10 to 0.05 mm corresponds to the diameter of the wire plus 50 micron. Smart Threading is the ideal accessory for the process of producing fine blanking dies for precision blanking, lead frames and dies for the electronic sector.

**Smoothsurf: Perfectly smooth erosion surfaces**
The quality is much better with Smoothsurf. The work of polishing manually during the machining processes for injection moulds, die-casting or extrusion tooling is very much reduced and in some cases even superfluous.

**Cutting PCD**
The new module is available as an option and allows to cut economically a vast quality range of PCD (polycrystalline diamond).

**High quality surface finish**
A surface finish of Ra 0.2 μm is reached as standard on all AC Progress VP. Roughness Ra down to 0.1 μm can be reached with the SF module option.
The advantage of using 2 different wires on a single-wire system

The AC Progress VP’s unique wire drives system allows a very special function in which two wires can be used in a single contour. Duotec in itself can massively reduce the time taken and running cost’s normally attributed to finer wire jobs. After carrying out the main cut on a larger diameter of wire a finer diameter wire is used to detail corners and provide the final trim cuts. Other benefits of Duotec includes a more robust process as the majority of the material removal is completed on a larger diameter wire.

Continual positioning precision

The high degree of precision of the AC Progress VP is achieved by perfectly combining major elements, such as the machine’s high static rigidity, measuring system that includes both transducers and optical scales, and the control unit. This means all individual elements works to their strengths under a bespoke control designed specifically for EDM.
The mechanical concept for maximum precision and repeatable results

Certified precision

Mechanic’s - the foundation of performance, AC Progress VP2 and VP3
The solid cast iron structure with a C construction concept guarantees high static and dynamic rigidity, making it possible to achieve a high degree of positioning precision. The work area can house considerably large pieces or various multiple tightening systems.

AC Progress VP4
Predestinated for highest workpiece weights on a fixed table. X, Y, U and V axes as slides and arms with the wire guides. Taking in account of their long travel paths, the axes are arranged in accordance with the principle of best positioning accuracy achievable. The entire work area can be used for small detail machinings on large workpieces or for multiple clampings.

Because space is important
GF Agiecharmilles machines ensure the minimum footprint but at the same time provide the maximum profitability for that floor space. With a sophisticated opening mechanism, access to the work area is orientated around been ergonomic, and providing the operator with the most comfortable workspace possible.
Dual measuring system
With two independent measuring systems, a precision in the μm range is achieved on the workpiece. Shaft encoders guarantee high dynamics and optimum process control. Glass scales continuously monitor and optimise the axis positions.

Optimal temperature stability
All the heat generated in the system is dissipated by cooling water. The cooling of the generator, control system and dielectric unit is regulated by heat exchangers.
Exploiting the wire electrical discharge machine potentiality to the full

**High degree of autonomy**

Rapid wire reel replacement
Replacing the wire spool is quick and easy. An automatic device conveys the wire from the back of the system to the work area in just a few seconds. The speed of change of wire is particularly important when using the Duotec functionality. It is quick, simple and can be done with one programme.

Autonomy
With all components, like standard wire spools up to 25 kg as well as unmatched running time for wear parts, real long term machining (machining hours) is achieved.

A guide for all diameters
Changing wires is quick and easy without having to change difficult and time consuming mechanical components. The GF AgieCharmilles wire guide system can in fact be used for any diameter of wires. As well as the obvious benefits the system allows Duotec wire functionality – a cheap wire for roughing and a high quality wire for finishing.
**Reliable wire threading**
The machine can be used to full capacity in reliable night and weekend operation. Agiejet threads reliably in all cases such as multiple clappings, of multiple openings in one workpiece or in the rare case of a wire break (even wires of 0.05 mm diameter). A prerequisite for real autonomous, automated ED wire-cutting operation.

**Filtering system autonomy and intelligence**
The AC Progress VP has a high degree of autonomy due to its smart filtering. The system will automatically reduce the erosion parameters if the filters begin to get clogged up. This allows the work in progress to complete ensuring none of the frustration of finding a part finish job after out of hours running.

**Convenient setting up**
All important control functions are available and grouped in Agiejogger, the handbox with its electronic handwheel and LCD display. All phases of setting up can be carried out conveniently.
**Versatility and Flexibility**

**Flexible priorities, independent from external CAD**
Arrange and select individually the cutting sequences for workpieces. Directly on the machine and without the need of an external CAM system. Even during ED machining, the Early/Late function, allows to alter cutting sequences in accordance with time criteria [e.g. EDM start in the evening and removal of drop-out parts in the morning] or any combination thinkable.

**Making the most of the work area**
The work area allows 360 degrees of workpiece positioning, but this is just the start of the Progress VP inherent flexibility. Once inputted the component can be edited, strategies changed, geometry altered, automatically measured, rotated and batched together with other workpieces, aligning the process with Agiesetup 3D. In fact the control system employed is renowned as been the most flexible, easy to use and production orientated on the market place.
**Subcontractor count, easy to calculate costs**

Agieplanning, the ideal module for planning without complicated calculation of contour lengths or cutting rates. Handled by means of a simple job description directly on the machine or on a PC, the machining time, the wire consumption are at hand for cost/planning calculations.

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**No manual alignment**

Automatic three-dimensional workpiece location with Agiesetup 3D in the work area, using the EDM wire and a touch probe. The control system takes account of any possible offset in space and independently assigns the new reference values to the geometry program.

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**EDM-specific Job Management System**

Optimally manageable machining without reprogramming by a CAM-station. The batch function combines several Jobs in one. With Agievision, priorities and sequences can be set flexibly and changed at any time.
Versatility and Flexibility

For practical workshop requirements

**Agiegeo**
Importing and exporting files in DXF and IGES. With this software, 2D-geometries can be modified directly on the machine.

**Graphic machining check**
Two or three-dimensional presentation of the Job to machine with Graficheck. Machining sequences can be simulated, the feasibility verified and the current state of machining visualised graphically.

**Priority work management**
Work in process can be suspended and all parameters stored with the Pieceinsert module. This is commonly used when an urgent workpiece is required, which can be inserted, cut and then continue with the original work exactly where it was left off in complete confidence, without changing or adding other data.

**Data input adapted to organizational conditions**
Flexible data input in accordance with the infrastructure of the workshop. With Agievision, the data input can be carried out flexibly:
- All data input entered directly on the machine.
- Import geometries and complete with the target data on the machine.
- Import geometries and target data, completed with measuring and position data on the machine.
- Import entire job data, including measuring and position data.
Target-oriented data input
Automatic generating of machining technologies and sequences with Easywork. It only requires surface quality, geometry, contour tolerance, workpiece material and height, as well as the wire type.
Maximum performance and low energy consumption

**Intelligent generator**
Increased EDM output, more powerful electronics, efficiently controlled EDM process. With IPG-VPC an improvement in the form factor of the pulses and a reduction in the pulse duration are achieved.

**Technologies for all requirements**
All common conducting materials can be processed to the best with the IPG-VPC generator using any type of wire. It also can handle exotic materials such as Ti and Iconel as well.

**Maximum productivity minimum time**
Prodtech is a new technological package for high speed cutting. It is designed to achieve good quality and precision, with speed and minimum running cost as its priority. It is achieved with an innovative type of discharge pulse, minimizing the number of cuts and therefore consumable usage.

**PCD technology**
The optional PCD module, produces tooling that sets new standards in edge definition, this increases the service life and gives far greater accuracy in form geometry. Many types of PCD can be processed owing to a vast range of on board technologies, be if differing grade or particle size.
High precision in taper cutting
The option Agieconic Plus opens new horizons of precision at conical machined surfaces with AC Progress VP.

Automatic process optimisation
Teccut is a powerful instrument making it quick and easy for the operator to automatically select the best parameters to suit their particular. To generate the technology the operator enters a description of the effective characteristics of the piece, such as the height, shape, material used, surface quality and texture that is required. This is done by a conversational method with the control prompting the user for information it requires. Teccut then selects a match for the workpiece but also offers alternatives if for example a priority should be set for surface finish accuracy or speed.

Quality of eroded surfaces
The quality of eroded surfaces is crucial for the longevity of the life of tools in punch and die applications. The IPG-VPC generator, designed to be the platform of generator evolution in years to come, ensures:
- Elimination of the affected lager in steel.
- Perfect surface integrity in carbide.
Advanced functions for EDM

Erosion experience on the machine totally at user’s disposal

Physical and process-determined influences are continuously regulated and optimised by the control system. The efficiency of the pulses is converted specifically into precision-leading results. In combination with the IPG-VPC heavy duty generator, these exclusive functions increase the accuracy on the workpiece.

**Constant speed in all contours**
Precise full cuts at maximum speed. Dynamic Corner Control continuously corrects physically determined contouring errors. The wire path is dynamically optimised. As a result, the quality of the geometry in full cuts improves so that trim cuts can be carried out faster, reduced or even avoided.

**Perfect contour accuracy and cylindricity**

Without AWO  With AWO

**Dynamic Corner Control**
Continuously corrects physically determined contouring errors. The wire path is dynamically optimised. As a result, the quality of the geometry in full cuts improves so that trim cuts can be carried out faster, reduced or even avoided.

**Accurate linearity**
Perfect contour accuracy and cylindricity. With AWO (Advanced Wire Offset), the influences of wire wear and flushing are technologically compensated.

**Highest form accuracy**
Best accuracy and linearity are achieved on the whole contour. Wire Bending Control determines the lateral wire deviation, caused by the process, in real time and is corrected with the process control, even at high cutting rates. At every point of the contour cut, WBC reliably implements the precision and roughness target entered in the control system – both in the case of cylindrical and tapered and also stepped workpieces.
**Eroded surfaces perfectly smooth with Smoothsurf**
The quality of eroded surfaces is very important in machining processes for injection moulds, pressure die-casting and extrusion tooling. The Smoothsurf module offers the possibility of achieving a high degree of surface evenness and smoothness. Higher quality can be achieved with Smoothsurf as the manual polishing operation is reduced and in some cases even superfluous.

**Automatic search for the initial hole with Smart Threading**
Using wires with small diameters means that the production parts must have very small initial holes. With the Smart Threading option the minimum threading diameter for wires measuring 0.10 to 0.05 mm corresponds to the diameter of the wire plus 50 micron. Smart Threading is the ideal accessory for the process of producing fine blanking dies for precision blanking, lead frames and dies for the electronic sector.

**Automatic power adjustment**
Power is automatically adjusted to changing conditions. With Variocut, stepped workpieces or workpieces provided with openings can be cut at optimal speed as the cutting cross section is continuously monitored. Variocut cuts an optimal homogeneous surface and a perfect linearity.
Efficient automation

Flexibility and highest exploitation of the machine
Integrated autonomy as a requisite for robotized machining processes
Extended out of hours running comes easy with AC Progress VP due to:
• 25 kilo wire reels;
• long working life of the filtering and deionizer system;
• long service life of the guides
• automatic re start-up after blackout;
• reliable immediate results thanks to advanced technologies;
• long service times

The electrical discharge machine system
The wire AC Progress VP2 is designed for all levels of automation expansion. The AC Progress VP2 is perfectly prepared for automation with the AC Pal or other system for loading pieces, thanks to the programmable bath level for a piece height of up to 250 mm and a clearly defined interface.
• The AC Progress VP2 has the ideal system for controlling the work of automated wire electrical discharge with Agievision control.
• Automated working cycles can be rapidly created for the system with Easyrun.
• With Robotcommand the AC Progress VP2 is equipped with a clearly defined interface, which can be used to connect handling instruments and robots.

Input of measurement data
The clearly defined interfaces allow the import of measuring machine data into Agievision by Network or USB stick.

Remote monitoring
The status of the system and the works in progress can be monitored from home or office at any time by using a special module. The AC Progress VP2 is prepared for remote monitoring with respective Software such as e. g. Remote Access Ultra VNC.
### About GF AgieCharmilles

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<th>Milling</th>
<th>High-Speed and High-Performance Milling Centers</th>
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<td>In terms of cutting speed, HSM centers are 10 times faster than conventional milling machines. Greater accuracy and a better surface finish are also achieved. This means that even tempered materials can be machined to a condition where they are largely ready to use. One essential advantage of HSM is that with systematic integration, the process chain can be significantly shortened. HSM has developed alongside EDM into one of the key technologies in mold and tool making.</td>
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<th>EDM</th>
<th>Electric Discharge Machines</th>
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<td>EDM can be used to machine conductive materials of any hardness (for example steel or titanium) to an accuracy of up to one-thousandth of a millimeter with no mechanical action. By virtue of these properties, EDM is one of the key technologies in mold and tool making. There are two distinct processes – wire-cutting EDM and die-sinking EDM.</td>
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<th>Automation</th>
<th>Tooling, Automation, Software</th>
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<td>Tooling for fixing workpieces and tools; automation systems and system software for configuring machine tools and recording and exchanging data with the various system components.</td>
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<td>Development, production and sale of the motor spindles that form the core components of modern HSM centers. The spindles rotate at speeds between 10 000 and 60 000 rpm.</td>
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<td>Service, maintenance, spare parts and consumables for EDM, milling and HSM systems as well as for other machine tools; consumables include filters, wire, graphite, copper electrodes and special resin.</td>
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