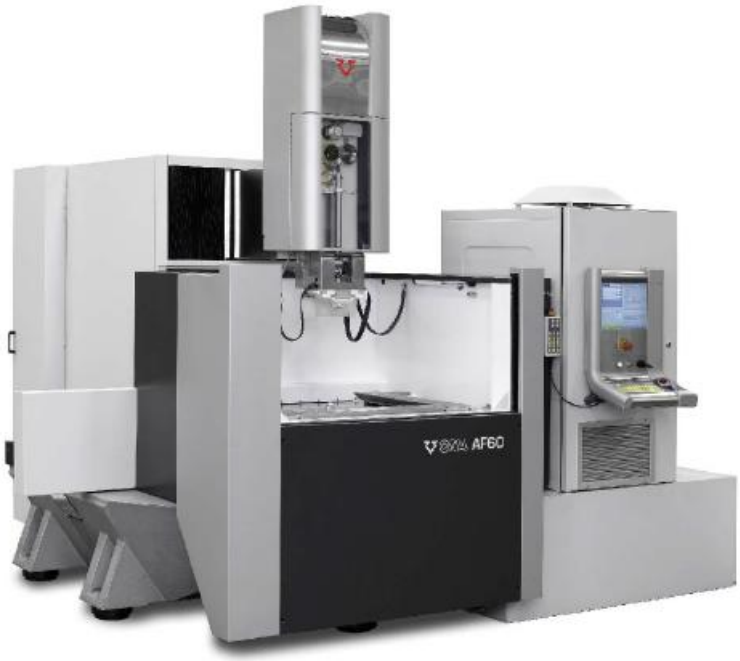
Technical Specifications
ONA AF60 modular



1. Technical specifications

Machine		
X,Y travels	800 x 600	mm
U,V travels	500 x 500	mm
Z travel	600	mm
Maximum workpiece dimensions	1300 x 1040 x 600	mm
Maximum workpiece weight	5000	kg
Maximum taper angle	± 30° / 400 mm	
Machine weight	7500	kg
Machine height	3020	mm
Total surface required	3625 x 3345	mm
Wire circuit		
Standard wire diameters	0.20 to 0.30	mm
Wire guides	closed-type, diamond	
Wire spool	up to 45 (DIN 355)	kg
Min. diameter of threading hole	0.5	mm
Automatic wire threader	standard	
Wire chopper	standard	
Dielectric		
Paper cartridges	2	units
ONA's patented mineral filter	optional	
Chiller	standard	
CNC		
Number of axes simultaneously controlled	X,Y,U,V,B	
Least input increment	0.001	mm
Screen	15" TFT colour	
Keyboard	flat, antidust	
RAM memory	512	MB

Generator		
Standard power supply	380 or 400	V
	50 or 60	Hz
Max. cutting speed (with 0.25 mm Xcc-type coated wire)	370	mm^2/min

2. Technical description

Submerged Wire cut **ONA AF60 modular** EDM machine, consisting of machine, filtering unit, CNC control and generator. High precision and maximum productivity in wire EDM.

Made in Europe. Machines manufactured in ONA central production unit, certified by ISO9001 and ISO14001 standards and complying with EC electromagnetic safety and compatibility standards.

2.1. Machine

- Very rigid and compact mechanical structure that guarantees an excellent positional accuracy and highly repeatable results.
- Symmetric structural design to minimize thermal deformations.
- Fixed table mechanical structure to handle very heave workpieces.
- Precision linear guides in all axes.
- Movement transmission by ball screws in all axes.
- Axes driven with position feedback by glass scales (X,Y,U,V).
- Positioning maximum speed : 2.000 mm/min.
- Low maintenance wire guiding system with easy guides and current pick-up replacements:
  - Diamond die guides.
  - Tungsten carbide current pick-ups.
- U-V axes system separated from the working place
- High reliability in the system:
  - High rigidity.
  - High protection against humidity.
  - Maximum utilization of the working tank.
- Compact design in order to minimize machine floor requirements.
- Automatic threading unit standard:
  - Work can be done with all types of wire, coated or uncoated, wire diameters range from Ø 0.15 mm to 0.33 mm (ONA patented).
  - The maximum height for threading is equal to the maximum travel on the Z axis.
  - Minimum maintenance required due to wear-resistant elements and optimized design.
  - Threading in flushing mode or during immersion, with no need for the work tank to be emptied.

  - Minimum threading hole diameter: 0.5 mm.
- Back wire chopper (standard).
- Handy controller (standard).
- Loading and tracting device for wire spools up to 45 kgs (DIN 355) (standard).
- Collision protection system, that will stop the motion of the axis when any unexpected force is detected by the software. Both the upper and lower heads are protected.

2.2. Generator

- MOSFET transistorized pulse power supply with optical fiber switching control
- Independent circuits for first cut and second cuts
- Independent control from:
  - Gap.
  - Power.
  - Off-time.
  - Voltage (100x250 V cc).
- Process information by displays (LED) of Short-circuit and Low Voltage.
- Average Voltage and Discharge current information.

2.3. CNC

- EXPERT EROSION SYSTEM (modifying automatically the programmed parameters of the power supply).
- AUTOMATIC STRATEGY (to generate programs automatically).
- New ergonomic design for the mobile CNC control cabinet.
- Large variety of languages.
- Compensation for the offset on the deflection point of the wire.
- Extensive set of automatic measurement cycles.
- Automatic alignment of the machine axes to the workpiece axes with automatic rotation of the programme based on the position of the part on the table.
- The CNC uses a windows-like display type, which is widely known and very simple.
- The programming is in assisted mode or directly using the ASCII editor.

- Alphanumeric keyboard (QWERTY Type) and trackball pointer.
- Programming language based on abbreviations (mnemonics), so that programming is very quick and simple. Also the operator may use the standard ISO code. The CNC also incorporates an automatic syntax control.
- Handy controller Standard.
- Automatic threading cycle: Standard.
- Control of the remaining machining time.
- History files: Different values like time, length, medium speed,…, can be keep.
- Technology charts with files treatment and possibility of saving in devices external to the machine like, disk, PCs, etc. In addition to the programs and technology tables one can use the following as files: offset tables, traverse point tables, wire radius tables and the cutting history of the workpiece (data regarding cutting times, alarms, etc.)
- Multi-tasking control. While a program is being executed, the control provides a graphic display of the workpiece, the cutting position in real time, and the path that has been travelled by the wire. Simultaneously one can edit and graphically simulate a new program.
- Automatic cycles:
  - Centering in inner cavities (slots, holes).
  - Zeros searching.
  - Vertical position searching.
  - Vertical position return.
  - Start point return.
  - Edge searching with tolerance.
  - Return to working point by programmed path.
  - Allowed working zone definition.
- Other functions:
  - Integral control of the process through the generator.
  - Automatic working parameters selection by definition of wire diameter, workpiece thickness and wire electrode / workpiece materials.
  - Individual selection of generator and machine parameters.
  - Execution modes: normal / dry run / machine lock / Step-step.
  - Rapid positioning X,Y,U,V.
  - Linear / circular interpolation XY-UV.

- Taper cutting by inclination angle.
- Graphic drawing level selection at any height selected.
- Establishment of coordinates.
- Establishment of Offsets and traverse points.
- Teach-in for positioning.
- Dwell time and input signals status.
- Metric/inches units.
- Absolute/incremental.
- Geometric transformations:
  - Displacement (each 0.001 mm).
  - Rotation (each 0.001º).
  - Mirror function independent on axes X-Y.
  - Axes change.
  - Scale factor.
- Wire radius compensation.
- External programs. Each program in memory or floppy disk can be used as a “macro-program” called from other programmes. Other characteristics: loops, labels, etc.
- Jumps: conditional or non-conditional with function repetition.
- Types of taper cutting: sharp corner taper cutting, constant corner taper cutting (ISOCONO), constant radius taper cutting (ISORADIUS).
- Corner rounding and chamfer functions can be used in the vertical cutting and in the cutting on four axes.
- Automatic rounding of negative radii.
- Corners control system to ensure high precision when radius and the sharpest corners of the workpiece are being cut.

- Special functions:
  - Error Positioning in X, Y and Z-axis compensation.
  - Auto power recovery after electrical main interruption.
  - Automatic entry into workpiece.
  - Machine stop possibility conditioned to wire breakage, optional stop or programme end.

- Display of:
  - Real time cutting point on workpiece path.
  - Coordinates.
  - Cutting speed.
  - Cutting length.
  - Command in execution.
  - Machine status.
- Remote supervision and remote control:
  - Network connection: RJ45 connector and Ethernet connection are standard with ONA AF units, so that the machine can be connected to any Local Area Network (LAN).
  - Delivery of automatic messages. Delivery of remote automatic e-mail messages to several operator locations with possibility of enclosing technology, compensations and history files of the current workpiece. In addition, the CNC allows for warning messages to be sent during the execution of a program.
  - Monitoring and remote control of the machines (optional). Thanks to the ONA Plant Manager communications program, users can remotely supervise and control the work process in real time (from a PC, PDA or mobile telephone).
  - Open control and supervision protocol. The ONA-W64 CNC has an open architecture allowing for the integration of ONA AF machines in advanced systems for production cost management and control.
  - Simulator program (optional) of the CNC to work in a PC: for learning, creation and verification of programs in a PC, etc.

2.4. Filtration system

- Standard: Paper cartridge filter:
  - 2 removable cartridges.
  - Tank capacity: 1610 l.
- Optional: Automated mineral filter
  - Low maintenance.
  - High efficiency.
  - Self-cleaning.
  - No need to interrupt the machine operation during the self-cleaning cycle.

- Cost-effective.
- Environmentally friendly: minimum waste generation.

- Deionization:
  - By mixed-bed DI resins.
  - Programmable from 2 – 100 μS/cm.

3. Installation requirements

- In order to ensure a correct installation and optimum functioning of the machine, it is recommended to take the following points into consideration:
- Electrical:
  - The machine can absorb an input voltage variation of ± 5%. In case voltage fluctuation become larger, an voltage stabilizer will need to be used.
  - Grounding: Individual. Impedance: 10 ohm maximum.
- Water:
  - Deionized water.
- Compressed air:
  - Dry air, 6 bar.
- Ideal environmental conditions:
  - Environmental temperature: 20ºC.
  - Humidity: max. 75%.
  - Vibration: max. 0,5 G.

ONA ELECTROEROSIÓN, S.A.
Eguzkitza, 1
Apdo, 64
48200 Durango
Bizkaia (Spain)
Tel: 94 620 08 00
Fax: 94 681 85 48
ona@ona-electroerosion.com
www.ona-electroerosion.com