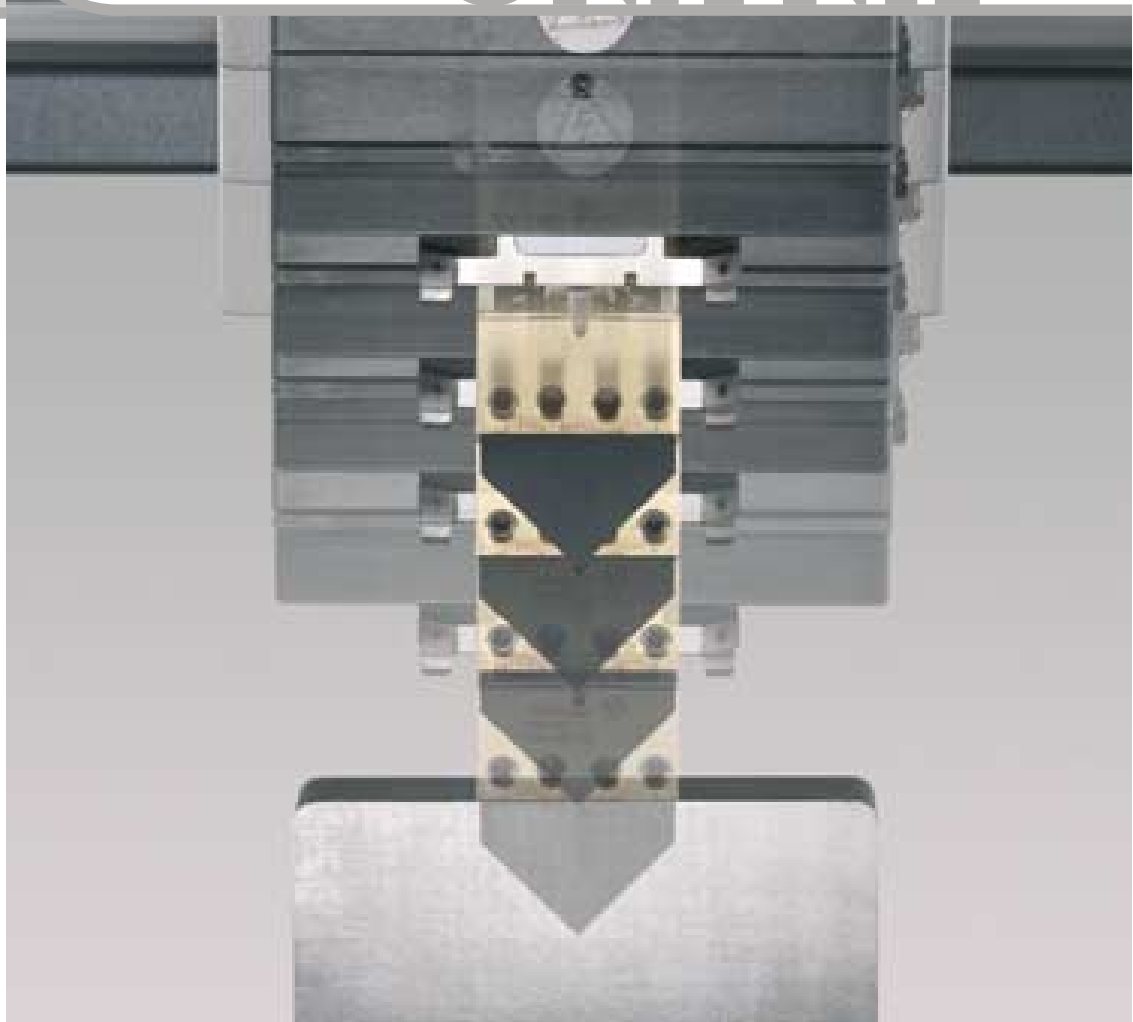
ONA NX



High-speed die-sinking EDM featuring high precision and easy automation

Spanish Design Prize
in Machine Tools

Operates fast, simple and with ease

The model ONA NX incorporates CNC with the latest generation with Windows based applications which contributes to important operating advances and a higher level of automation.

The ONA NX range responds to a new conception of machine based on the ideal that they are predominantly simplicistic, with an efficient design while at the same time that offers the operator a substantial improvement in comfort. The ONA NX does not sacrifice security to improve comfort however, because it's rigourous development conformed to all the present regulations of security and has also maintained electromagnetic compatibility.

As an example, the mobile console emphasizes of its excellent ergonomic design while still incorporating the CNC. Besides, the compact design of the machines NX manages to reduce the maximum surface used in busy plant, but still uses permanent filters.

The finest EDM specialists are at your service

At ONA, we understand that one of the best ways to ensure our clients' success is to offer service and technical support that will enable them to get the most out of their EDM machine.

The Processes and Technology Service at ONA, managed by EDM Specialists, aims to ensure that each of our products will fit perfectly into the client's particular application.

This exclusive service is absolutely free.

Extremely rigid mechanical structure

Stiffness and precision are hallmarks of the new ONA NX units. State-of-the-art methods have been used in their development, while the finest of modern machining and assembly techniques have gone into their construction.

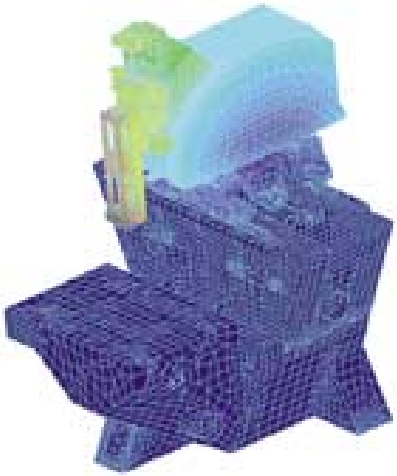
Each machine is verified with a laser that checks the positioning of each axis to make sure it meets the norm of VDI 3441. Also, each machine must comply with the restrictions according to ISO 230-4.

Large loading capacity and long traverses

The fixed-bedframe concept allows obtaining very long traverses on the X and Y axes, as well as high stability.

The clamping system is fixed, so that the weight of the workpiece rests directly on the frame. The guidance system for the X-Y axes is thus submitted only to light, mechanical forces.

The structure of the machine is constructed of stabilized fine grained cast iron blended with graphite. Structural design is symmetrical so that thermal deformation will be held to a minimum.



Optimized design using finite-element method

The mechanical structure of the machine was designed by the finite-element method (FEM), with every aspect studied under the most extreme conditions. The points subjected to the greatest stresses are reinforced, so that the structure is optimized.

The result is maximum rigidity, which is a basic requirement for high-precision machining.

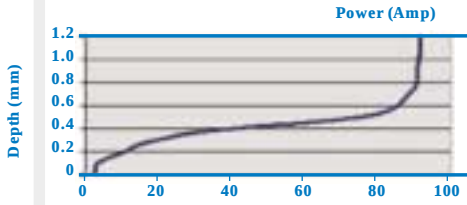
Precision that lasts

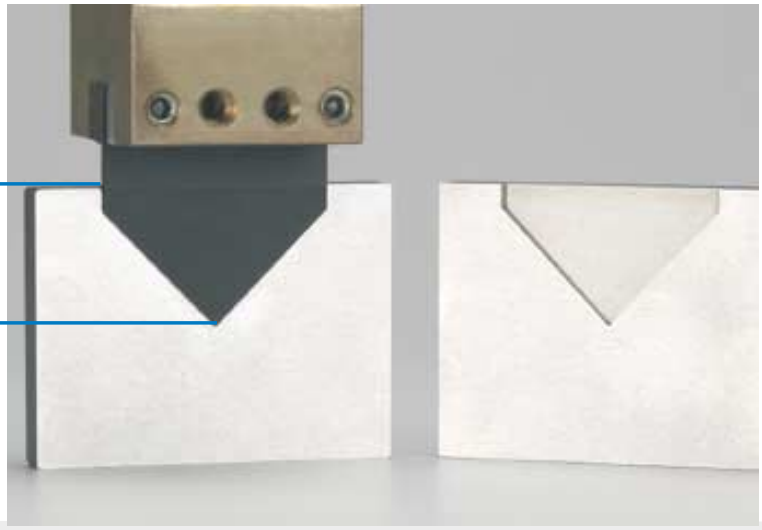
To ensure very high precision, the X-, Y-, and Z-axes are positioned by servomotors and ball-mounted spindles of superb quality, controlled by glass scale closed-loop CNC. Sliding is on special designed ways.

Direct control positioning of the X, Y, Z axes

In all ONA NX models, positioning control of the X, Y, Z axes is done by high precision glass scales. The use of glass scales determines axis position directly, and allows the operator to know exactly where the electrode is at any moment.

A new generator that contributes to important advances in automation



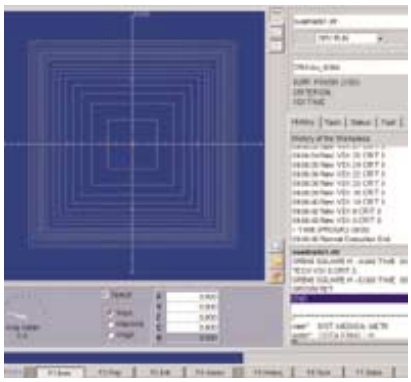


Technology used:
Technology for graphite/steel ribs
Depth: **30 mm**
Surface finish:
20 VDI - Ra 1.00 µm

SAAC system: Top performance and full automation with tapered surface electrodes

The SAAC (Surface Automatic Adaptive Control) system, forming part of the new generator in the NX machines, maximizes generator performance in erosion work involving tapered surface electrodes.

It adjusts the erosion intensity to suit the area being eroded, and is particularly adept where the workpieces have changes on the erosion surface during machining. It operates without special programming or any other initiative on the part of the operator because of the Expert Erosion System in the CNC.



JOS System: Jump Orbit System

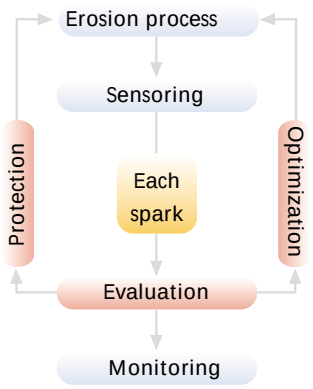
The new JOS system reduces the run time of the erosion that orbits make. The System defines that areas of the orbit that already have been finalized and only erodes in the zones where it is necessary. This improves erosion time and is especially significant in works that require electrodes with complex forms or electrodes with large surfaces.

Surface finish of VDI=0

The highly reliable performance of the ONA NX series generator can give a surface finish to VDI=0 in both erosion operations and in fine-finish mode.

BES: Burning Expert System

Burning Expert System (BES)



100% of unattended operation in difficult jobs

On the basis of the years of experience of ONA in developing generators with a high level of automatic control of the erosion process, ONA has created the new Expert Erosion System called BES.

This new module represents a new advance of ONA in the improvement of the yield of unattended operation. This new system is complex and demanding, yet works in the grooves of great depth without cleaning, surfaces, etc. It can automatically be made with the maximum quality assurances and precision, with the certainty that the generator will give the maximum in each phase of machining.

Analysis of the BES System:

- **Control by spark**

Measurement of all the characteristics of each spark, time of ionization, level of unloading, etc.

Detection of the conditions of erosion in each spark and case specific protection of workpiece.

- **Control of spark**

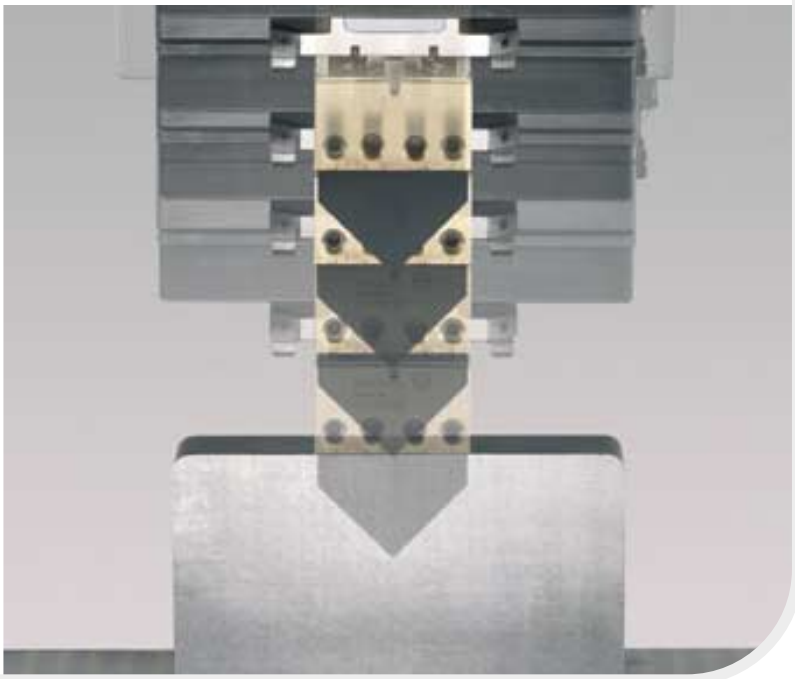
It evaluates groups of sparks and it acts case specific when it is necessary.

- **Control of timings**

Evaluation of timing, analyzing previous values and modifying the regime with the objective to increase the yield of the erosion.

Electrode: **graphite**
Workpiece: **steel**
Surface area: **200 cm²**
Technology applied: **Technology for graphite/steel surfaces**
Surface finish: **20 VDI- Ra 1.00 µm**

Proven advances in performance, precision and surface quality



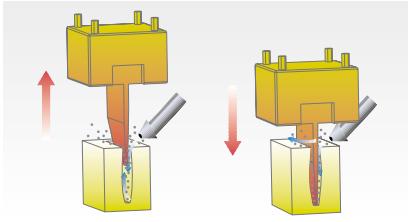
Higher precision

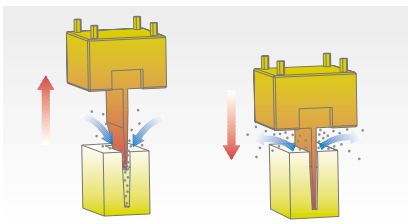
The high-speed pulse technology that incorporate the ONA NX models, makes it possible to machine cavities faster and more precisely.

It is no longer necessary to use side flushing lances and malformations in the eroded cavity can be avoided. These malformations are often produced by the dielectric flow and can reducing the electrode's undersize and the technology of the NX eliminates this.

Deeper machining in work with grooves

Very deep cavities can be machined, with the highest quality and precision guaranteed.

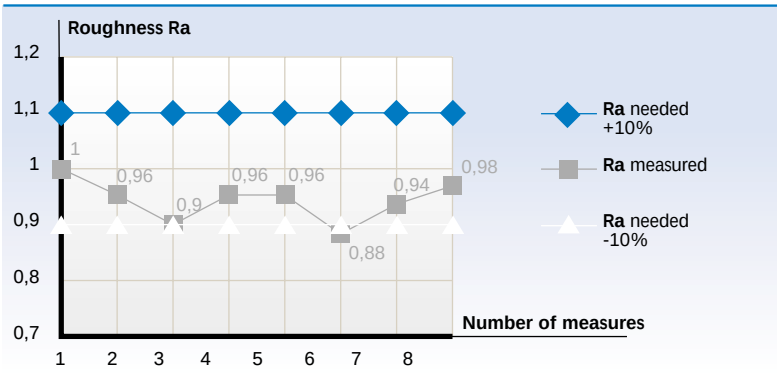




Electrode: **graphite**
Workpiece: **steel**
Technology used:
Ribs technology
Depth: **100 mm**
Surface finish:
22 VDI - Ra 1.26 µm

Electrode: **copper**
Workpiece: **steel**
Surface area: **225 cm²**
Technology applied:
Technology for copper/steel surfaces
Surface finish required:
20 VDI- Ra 1.00 µm

Measured finish surface



Technology tables and specific strategies for grooves

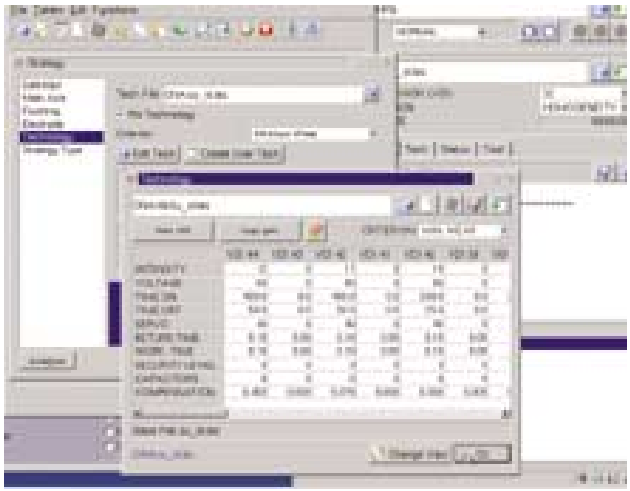
The ONA-S64 CNC incorporates technology tables specifically for the machining of grooves.

The Strategy Generating Wizard for automatic program generation incorporates the information that the operator needs so that he can quickly and automatically generate the most suitable program for the type of groove being machined.

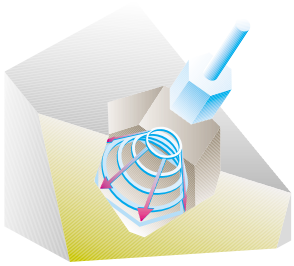
More homogeneous finish on large surface areas

Another advantage of high-speed pulse technology is more homogeneous finish on surfaces of large area.

The ONA-S64 CNC belongs to all NX models and incorporates technology tables specifically intended for an excellent, homogeneous surface finish where the working area is large.



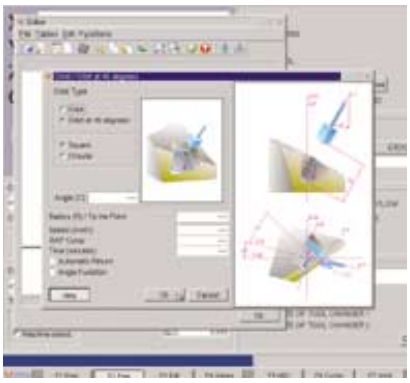
CNC that allows 3D work without limitations

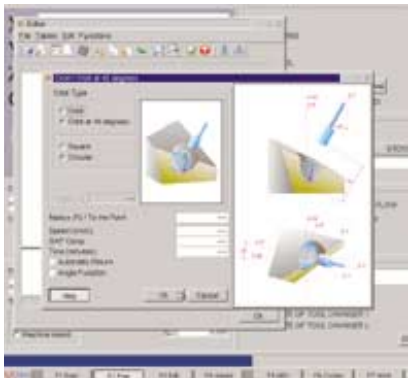


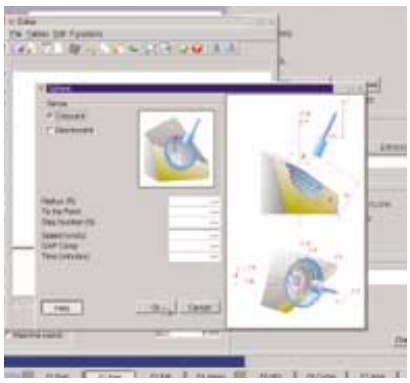
A-SPACE function

The ONA-S64 CNC incorporates the new function A-SPACE (Axis for erosion in SPACE). With this, any programmable CNC erosion function (spheres, taper machining, orbital machining, vectors, etc.) can be carried out in any spatial direction.

Programmable fixed cycles:
- Circular orbital.
- Circular orbital at 45º.
- Square orbital.
- Square orbital at 45º.
- Vectorial erosion.
- Decrescent / Crescent square cone type erosion.
- Decrescent / Crescent circular cone type erosion.
- Orbital erosion with ANGLE function.
- Decrescent / Crescent spherical erosion.







3D SETUP: simplification and time reduction in the completion of work piece

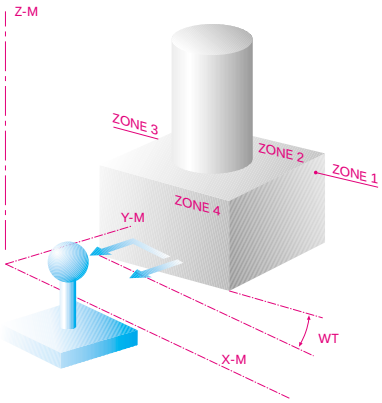
The module 3D SETUP that incorporates ONA-S64 CNC includes an extensive set of automatic measurement cycles that serve to simplify to the tasks of completion of the workpiece and electrode in the machine.

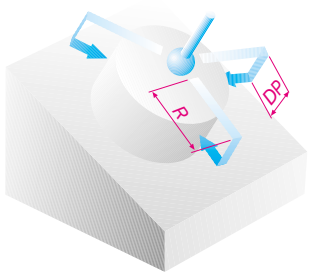
The module 3D SETUP allows to make:

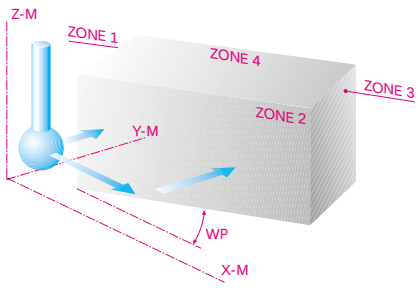
• **Manual Movements**: from the remote control movements in the machine can be executed according to a defined axis of erosion and the main axes. This makes it possible to execute all type of balances in the space with associated manual movements.

• **Automatic balances in any direction of the space**: It is possible to automatically make balances in interiors, exteriors, corners, faces and midpoint of each workpiece in any plane defined in any direction of the space.

• **Automatic alignment of the axis-machine to the axis-piece**: The automatic alignment can take automatic measurements of the deviation of the piece with respect to the main axes. 3D SETUP also makes the automatic correction of the program, the orbits and axis C.







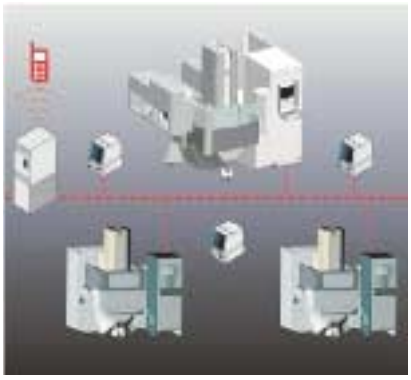
CNC enabled with ethernet connection, USB, messages to a mobile phone...

• **Ethernet connection, USB and authomatic messages.**
The RJ45 connector and the ethernet connection that is standard with ONA NX units are a major breakthrough in control and automation, so that the machine can be added to the any Local Area Network (LAN).

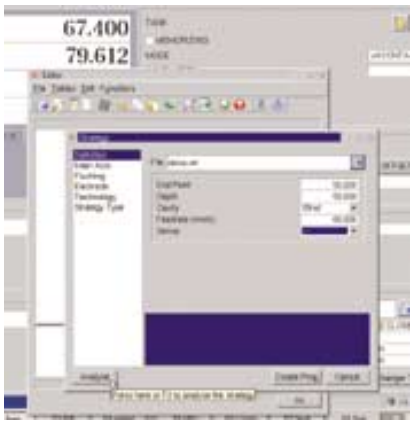
ONA-S64 CNC also allows the delivery of remote automatic e-mail messages to several locations of the operator, with possibility of enclosing files of technology, compensations, and the history the current workpiece.

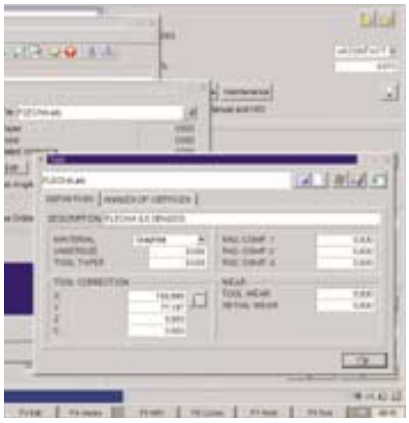
In addition, it is allows warning messages to be sent during the execution of a program, so that the operator is aware at the very moment of the current state the job.

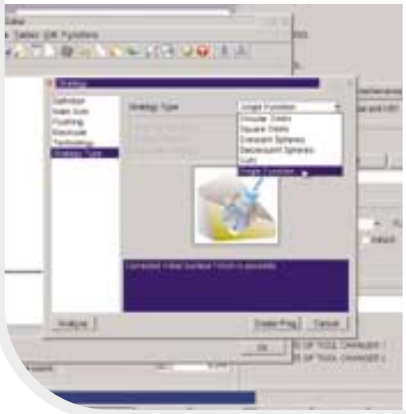
• **Multi-task Control**: During the execution of a program, the control visualizes in real time the execution of the trajectory of the orbits. It also determines the efficiency of the generator and the representation of multiple workpieces. In addition, it is also possible to publish programs, technologies, strategies, and projects.



Strategy Generating Wizard







The Strategy Generating Wizard analyzes the optimal erosion process, showing the roughing and finishing regimes, the electrode's undersize and generates the program automatically.

The machine operator must fill out a simple questionnaire specifying:

1. Characteristics of the work:

• Depth, type of cavity, workpiece and electrode material, axis of erosion, and which electrode to use.

• Selection of the work criteria: speed, superficial homogeneity, and minimum wear.

2. Technology:

• Definition of rough parameters:
- Directly introducing the initial VDI.
- Defining the front area of the electrode.
- According to a value of given sub-dimensions.

• Definition of finished parameters:
- Introduction of the final VDI.
- Defining the total surface of the electrode.

3. Finished strategies:

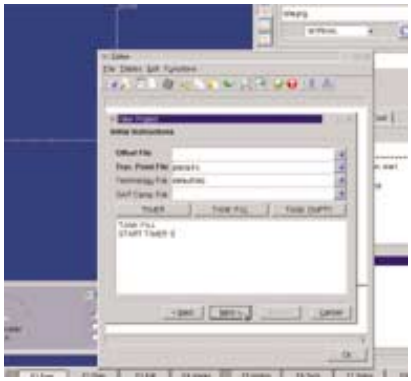
- Circular, square orbitals.
- Increasing, decreasing spheres.
- Completion of edges.
- Erosions, etc.

4. Specifics of the erosion:
- Location tables of the angle of the electrode.
- Parameters of cleaning.
- Technology tables , etc.

With this system, once the minimum data has been entered, the Strategy Generating Wizard analyzes the job and generates the program automatically. With the automatic strategies, ONA's decades of experience is in the hands of the operator. This considerably reduces the training time of the operator.

If the operator wishes to add his own experience to the CNC, the NX models allow him to create his own technological tables and use them in drawing new programs.

Project Generating Wizard



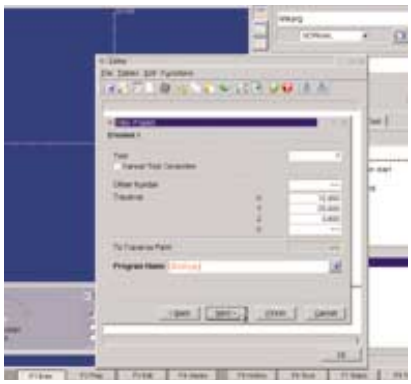
The works that demand the use of multiple electrodes require long and complicated programs. With the purpose of simplifying the programming and management of this type of work, the new ONA-S64 CNC incorporates a tool of programming called the Project Generating Wizard.

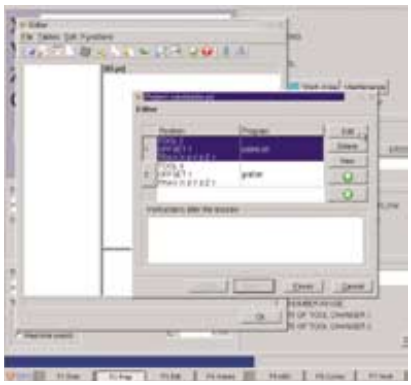
The Project Generating Wizard is a manager of strategies and electrodes and will help indicate:
- Files of characteristics of electrodes.
- Electrodes to use.
- Erosions to use with each electrode.

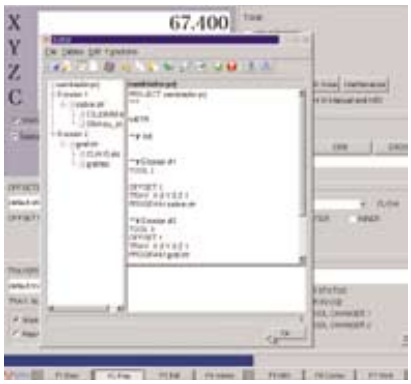
The Project Generating Wizard visualizes with a tree-like structure, a summary of the generated work, allowing the operator to quickly file any project.

Also it presents/displays a summary of the work to make, publishing strategies, programs, files of staggers, technologies, etc. of the attended form.

The worker also can interchange programs, strategies, instructions, etc. between different projects. Thanks to this tool it is possible to manage the complex works in a very fast and flexible format.







Effective Automation

The new ONA NX machines are designed to automate all type of works in a simple and effective way.

The powerful ONA-S64 CNC that the machine incorporates, combined with an automatic electrode changer with 40 stations (ø 51 mm) and a pallet-changer for workpieces, allows the possibility of automating the most complex jobs at an affordable cost.

The 40 position rotary electrode changer is standard and is totally integrated in the machine and to the control, and also has a remote control. With the purpose of saving movements and time, the changer has a double clamp that reduces to half the cycle to replace and to put a new electrode the chuck.

The rotary changer allows the use of:
- 40 electrodes - ø 51 mm.
- or 20 electrodes - ø 105 mm.
- or 13 electrodes - ø 160 mm.

The ONA NX models can incorporate up to two linear tool changers, placed in each side of the work tank.

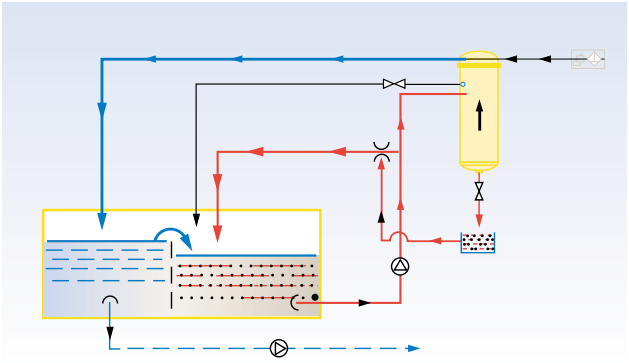
Each linear tool changer of electrodes is available in 2 different configurations.

• In **models NX4 and NX4C**
- 6 positions with distance between centers of 80 mm.
- 11 positions with distance of 38 mm.

• In **model NX6**
- 8 positions with distance between centers of 85 mm.
- 16 positions with distance of 38 mm.

• In **model NX7**
- 10 position with distance between centers of 80 mm.
- 20 positions with distance of 38 mm.

Fully automated ecological filter



Filtering element: special paper filter tubes

The problem of dielectric filtration was solved by ONA many years ago and is still thought to be a considerable advancement in development over the commonly used filters in EDM.

Important competitive advantages of buying an ONA:

- Filtration without cartridges
- Long duration (average life of more than 10,000 working hours)
- Reliability
- Ecologically friendly
- Excellent filtering quality (1 micron)
- Automatic cleaning and automatic sludge extraction.

Maximum production

This totally automated filter allows work to go uninterrupted in the machine. It does not need to shutdown the machine for removal of sludge.

Major savings

Thanks to the ONA filtration system it is possible to obtain a cleaner production process. No consumable agent has to be replaced or disposed of.

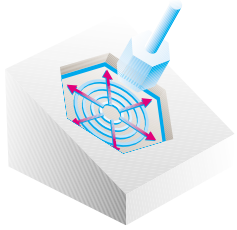
Example related to conventional cartridge filter.

Filter costs: 6 elements..... **30 €**/ea.
Hourly EDM rate..... **25 €**/ea.
Labor costs..... **25€**/h
Frequency of change..... **150/200** working hours
Time required..... 0.5 hr.

Total filter expense
Filter costs..... 180€
Lost productivity.....12 €
Labor cost..... 12€

Total costs in 2 weeks (150 / 200 hr.) **205 €**

The ONA filter system will yield annual savings (50 weeks) of at least 5,125 €.



Features of the ONA-S64 CNC

4 axes simultaneously controlled by CNC X, Y, Z, C.

Interpolation
Linear, Circular, Helical.

Capacity of memory (optionally expandable up to)
64 MB RAM up to 6 GB.

External interface
USB (mobile flash disk) (32 MB ~ 1 GB), RJ 45 connector RJ 45 and Ethernet.

Off-site transmission of automatic messages (e-mail)
Via PC or mobile phone.

Programming language:
ISO standard assisted or ASCII.

A-SPACE function (Axis for erosion in SPACE)
With this function, any programmable CNC function (spheres, taper machining, orbital machining, vectors, etc.) can be carried out in any spatial direction.

Type of execution
- Normal
- Automatic
- Single block
- Dry run
- Return by profile

Graphic representation
Display in real time of the orbit that is being executed
Contouring. Multicavities. Efficiency of the Burning Expert System.

Languages
English. Spanish. French. Italian. German. Portuguese. Traditional Chinese. Simplified Chinese.

Alarms and diagnostics
Displayed with text explaining alarms and diagnostics on the TFT monitor (program registers, time of the orbits, time of the regimes, etc.).

Coordinate System
Vectors: Coordinates of workpiece, machine, and representation of space coordinates.

Strategy Generating Wizard
Automatic program generation.

User's technological tables and strategies
The operator can create his own technological tables and use them in drawing automatic strategies.

Technology tables and specific strategies intended
- For grooves
- For large surface areas

Project Generating Wizard
Automatic Project Generation

3D SETUP: Automatic cycles of measurement in any direction of work space
- Automatic balances in interiors, exteriors, angles, faces and midpoint of a piece in any direction of the space.
- Automatic alignment of the axes machine to the axes piece and automatic correction of the program, the orbits and axis C.
- Manual movements according to main axes and axis of erosion.

Configuration of the work area
The usable workspace can be defined by the machine operator.

Anti-collision
It avoids the possibility of breaking the electrode in the event of a collision with the workpiece.

Jumps
Conditional and Non-Conditional with function repetition

Electrode correction
Electrode center errors correction.

File system of several programs types
Archive technologies, tables, programs, passes, compensations, and history. Use the Window's Based Explorer (browser) to access archives.

Compensations
- Gap compensation
- Electrode radius compensation
- Error Positioning in X, Y and X-axis compensation.

External automatics
Controlled by program.

Canned cycles
- Orbital machining (circular and square).
- 45º orbital machining (circular and square).
- Taper machining (circular and square, increasing or decreasing).
- Spherical machining (increasing or decreasing).
- Helical machining (internal or external).
- Vectoral machining.
- Orbital machining with ANGUL function.

Automatic switching off
Machine will power down at conclusion of the work or if a situation alarm happens.

Automatic switching on
Machine will power back up after power failure.

Specifications

		NX3	NX4 / NX4C	NX6	NX7
Machine					
"X" axis	mm	400	600	1.000	1.500
"Y" axis	mm	300	400	600	750
"Z" axis	mm	300	400	500	650
"C" axis	º	360	360	360	360
X-Y-Z positioning resolution	mm	0,001	0,001	0,001	0,001
C positioning resolution	º	0,001	0,001	0,001	0,001
Work tank					
Door		frontal opening	frontal o./rise and fal	rise and fall	rise and fall
Tank dimensions	mm	900 x 600 x 330	1.200 x 800 x 450 1.100 x 800 x 450	1.700 x 1.000 x 600	2.300 x 1.300 x 700
Work table dimensions	mm	600 x 400	800 x 600	1.200 x 800	1.700 x 1.000
Max. distance between head and table					
·(without "C" axis)	mm	530	680	800	1.000
·(with "C" axis)	mm	450	600	720	960
Max. dielectric height	mm	290	420	565	665
Allowable weight on table	kg	750	1.500	4.000	10.000
Max. electrode weight (*)	kg	100	200	400	400
Max. electrode weight (with "C" axis) (**)	kg	50/12	50/12	50/12	50/12
Allowable weight on electrode changer (***)	kg	40/10	50/10	50/10	70/10
Generator					
Maximum power (Medium / Peak)	A	60/100	60/100	60/100	60/100
Programmable intensities	Nº	12	12	12	12
Ignition voltage	Nº	80-100-120-160-200			
On-time	µseg.	1 to 6.500 programmables			
Off-time	µseg.	1 to 6.500 programmables			
Maximum stock removal rate with copper	mm^3/min	500	500	500	500
Maximum stock removal rate with graphite	mm^3/min	600	600	600	600
Electrode wear with cooper	%	0,2	0,2	0,2	0,2
Electrode wear wit graphite	%	0,1	0,1	0,1	0,1
Minimum surface finish	VDI	0	0	0	0
CNC					
Display		15" TFT (colour)			
Mouse		Trackball			
Keyboard		Membrane, dust resistant			
Remote control		standard			
Dielectric					
Total capacity	L	580	1.260	1.650	3.400
Filtering system		Cartridges	Long life ecological filter		
Filtering quality	µm	3-5	1	1	1
Change of filter elements	horas		>10.000	>10.000	>10.000
Flushing method		Automatic			
Flushing:					
· Head (pressure, intermittent)		1 to 31 programmables			
· Tank (pressure, suction, intermittent)		1 to 31 programmables			
General characteristics					
Total weight	kg	2.600	4.900	7.000	9.000
Total surface	mm	2.190x1.880	2.575x2.480	3.260 x 3300	3.860 x 4.525
Maximum height	mm	2.360	2.710	2.880	3.380
Maximum height (****)	KVA	10/13,5	11,5/15	11,5/15	13,5/17

Options

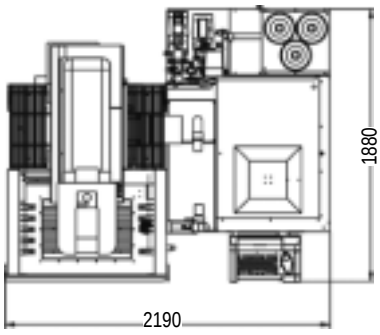
- "C" axis
- Linear electrode changer with 6 to 40 stations
- Rotary type electrode changer with 40 stations (ø 51 mm).
- Dielectric cooling device
- Current voltage stabilizer
- Generator of 120 Amp of medium intensity – 200 Amp of peak intensity.
- Generator of 240 Amp of medium intensity – 400 Amp of peak intensity.
- Long life ecological filter (for model NX3)

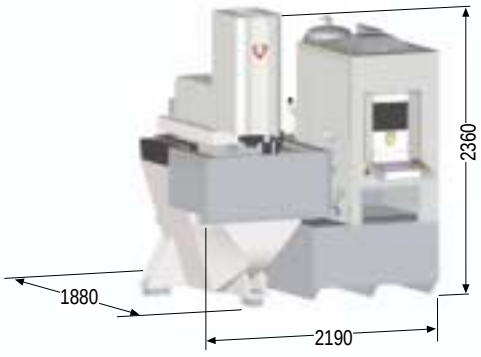
(*) On electrode holder plate (**) Static/Dynamic depending on geometry (***) Total weight/Unit max. on linear electrode changer (****) 60/120 Amp. Medium Intensity

In our continuous effort and commitment to up-to-date technology and design, ONA ELECTRO-EROSION reserves its right to introduce modifications in the specifications in printed in this catalogue without prior notice.

Range and models

NX3

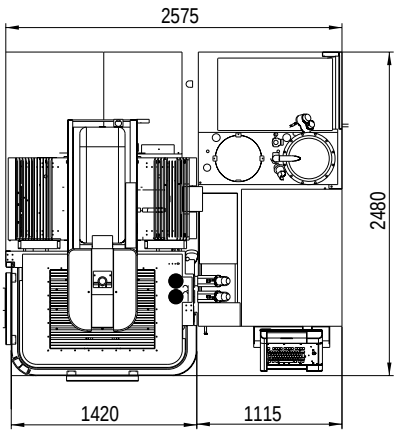


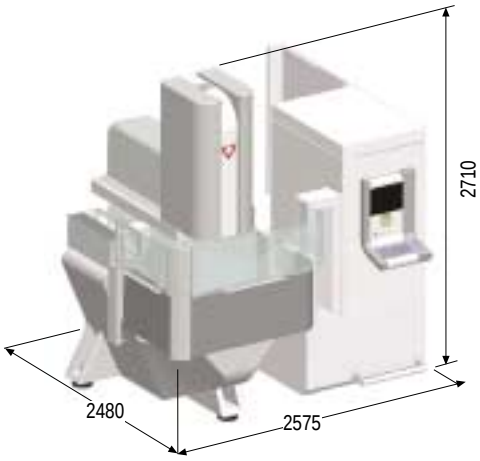


The footprint of models NX3 **with** long life ecological filter or cartridge filter

Range and models

NX4

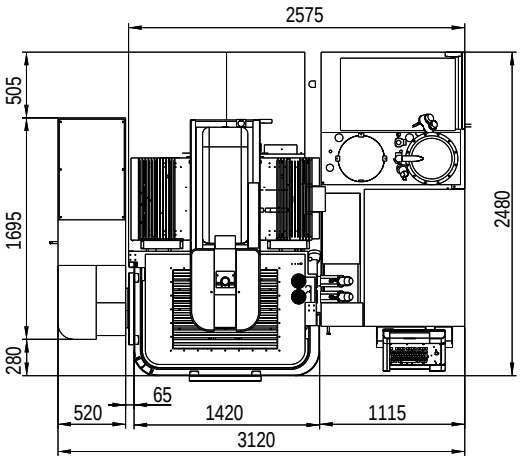


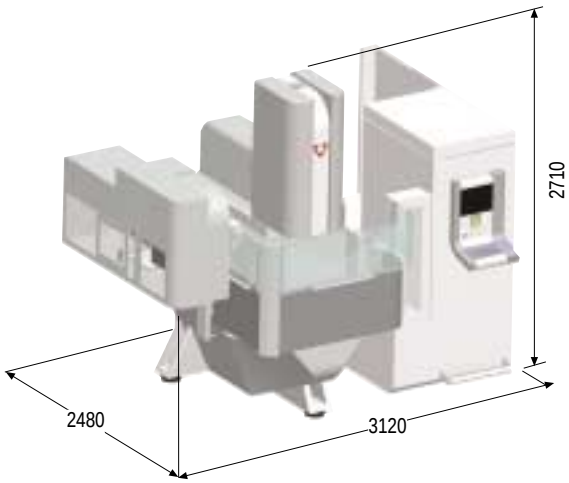


The footprint of models NX4 and NX4C (**without** 40 position rotary electrode changer).

Range and models

NX4C
Rise and fall
working tank

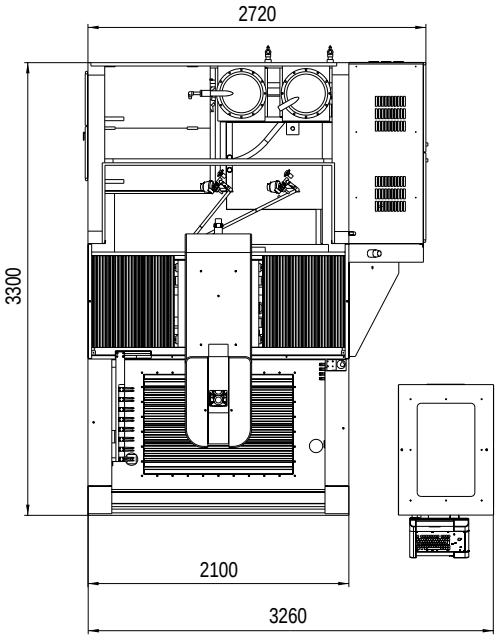


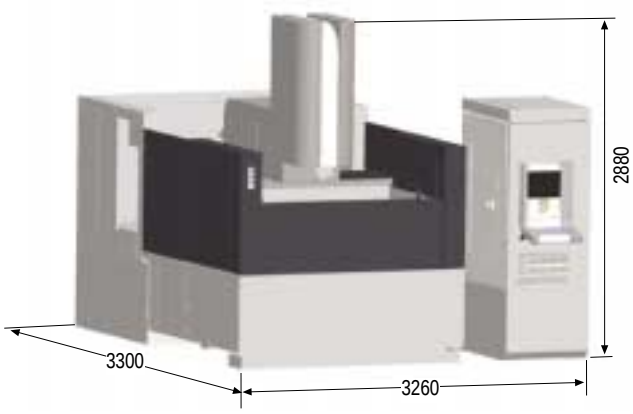


The footprint of models NX4 and NX4C (with 40 position rotary electrode changer)

Range and models

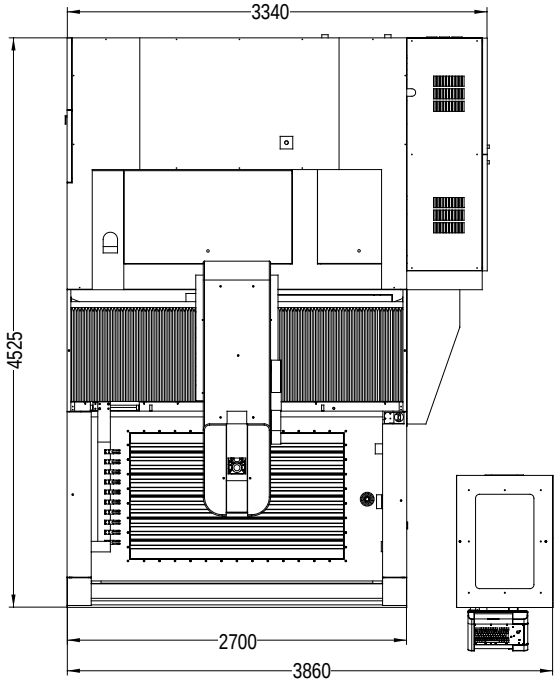
NX6
Rise and fall door

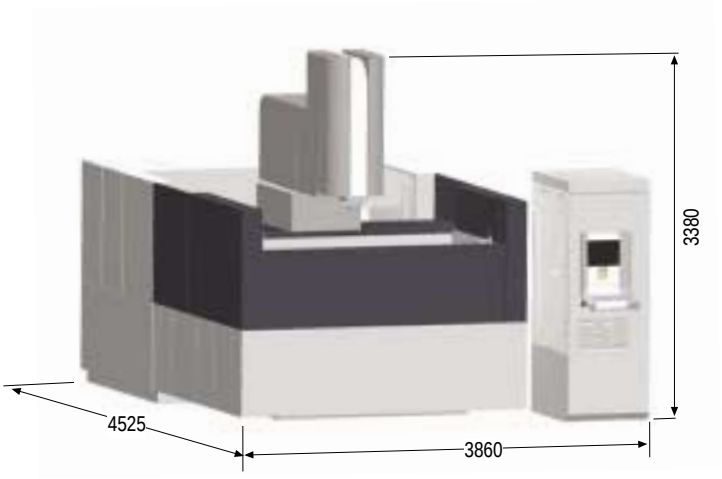




Range and models

NX7
Rise and fall door





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