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WE
ARE
EDM

ONΛ

\ OUR TOP ELECTRICAL DISCHARGE MACHINING EXPERTS AT YOUR SERVICE

At ONA we understand that one of the keys to the success of our customers is providing them with the service and technical advice necessary to enable them to get the most out of their EDM machine.

ONA's Technology and Process Service (TPS), provided by our top experts in electrical discharge machining, aims to ensure the seamless integration of our products into the specific environment of each customer.

Making sure that our customers will always get the best performance from their ONA machine.

\ WE ARE EXPERTS

We are experts in EDM, focusing on the research and development of EDM technologies.

\ WE ARE PROUD

Over 60 years of experience, 14,000 machines installed, a highly qualified team of professionals, with extensive knowledge and a promising future.

\ WE ARE YOUR SOLUTION

We adapt our knowledge and resources to find the best solution for our customers.

\ WE ARE CONFIDENT

We guarantee 100% productivity. We offer quality, reliability and results. Because we are confident in our technology.

14,000

machines installed across the world.

90%

of our production is exported.

60

countries on all 5 continents have ONA machines.

70

different configurations for large machines.



A COMPACT, LOW-COST MACHINE

High-speed and ultra-compact electrical discharge machining.

QUICK AND EASY TO OPERATE.

The **ONA NXF** models come with a CNC with a Windows-style operating system, making it easy for the operator to use and giving it a high level of automation.

The **ONA NXF** range is a new concept in machinery, based on an industrial eco-design, where simplicity and efficiency come first.

MINIMUM SURFACE, MAXIMUM RELIABILITY.

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The **ONA NXF** range is a new concept in machinery, based on an industrial eco-design, where simplicity and efficiency come first.



\ NX3F

>>
OUTSTANDING
GENERATOR



\ NX4F

>>
LASTING PRECISION
GUARANTEED

\ MECHANICS

Guaranteed precision.

HIGH RIGIDITY AND STABILITY.

The **ONA NXF** range of machines feature high rigidity and precision. This has been made possible by using the latest design and analysis methods in their development.

Each machine is checked by lasers, to ensure that the positioning of each axis complies with standard VDI 3441.

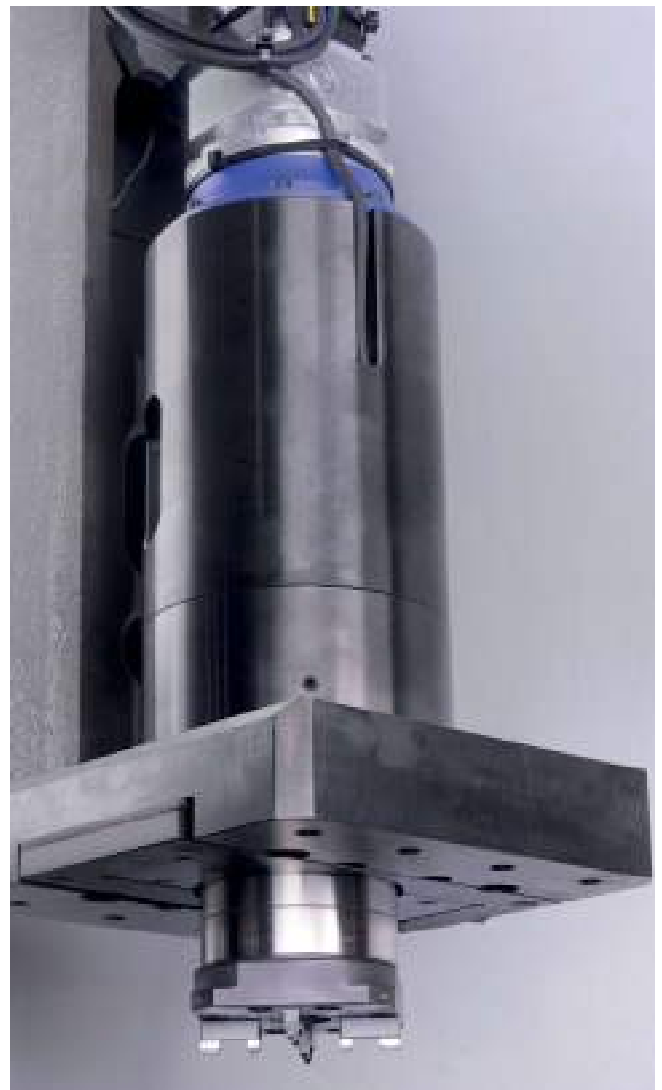
Additionally, circular tests are performed on each machine, in accordance with ISO 230-4.

OPTION TO INCLUDE A C-AXIS WITH A HIGH LOAD CAPACITY.

A C-axis that can support weights of up to 50 kg. Thanks to its robust design, the C-axis allows you to work with precision, even with electrodes that are outside the centre of rotation of the C-axis.



C-axis supports up to 50 kg.





HIGH LOAD CAPACITY ON THE TABLE.

The fixed-bed plate mechanical design of **NXF** machines means that you can obtain long travel length on axes X, Y and Z as well as high stability. The work table is fixed, so the weight of the workpiece rests directly on the frame of the machine.

The machine's frame is made from stabilised grey cast iron and it has a symmetrical structural design to avoid thermal deformation.



DIRECT MEASUREMENT OF POSITIONING ON THE X, Y AND Z AXES.

With **ONAM NXF** models, measurement of positioning on the X, Y and Z axes is performed using linear optical rulers, measuring down to thousandths. Using these rulers makes it possible to directly measure positioning on the axes, so that you always know the actual position of the electrode with the utmost precision.



LASTING PRECISION GUARANTEED.

To ensure complete accuracy in the positioning of coordinate axes X, Y and Z, it is operated using servomotors and ball screws of the highest quality, controlled by the CNC in a closed loop, sliding on high-precision linear guides.

\ GENERATOR

A generator that brings significant advances in automation.

SISTEMA SAAC: COMPLETE AUTOMATION FOR WORK WITH ELECTRODES WITH EVOLVING SURFACES.

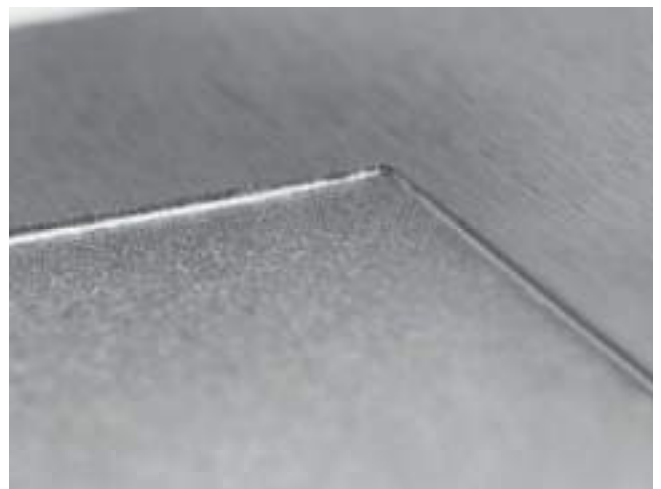
The SAAC (Surface Automatic Adaptive Control) System built into the **ONA NXF** machine generator maximises the efficiency of the generator when performing EDM in which electrodes with evolving surfaces are used.

The system adjusts the intensity of the spark according to the usable area being machined at that moment.

Using the SAAC System is particularly beneficial for work on pieces whose erosion surface changes significantly during machining. No intervention or special programming is required by the operator as it is fully integrated into the CNC Expert System.

OUTSTANDING PERFORMANCE (0.1 RA)

The **ONA NXF** model generator provides fully reliable operation and ensures outstanding performance, both during start-up operations and fine finish processes (0.1 Ra).



Burning Expert System (BES).

100% PERFORMANCE OPERATING UNSUPERVISED, FOR THE MOST DIFFICULT JOBS

Based on **ON A**'s extensive experience in developing generators which provide high-level automatic control of the EDM process, **ON A** has created a new BES (Burning Expert System).

This new system is **ON A**'s latest development to improve the performance of generators when operating unsupervised. It makes it possible to perform complex and demanding jobs, work on deep grooves without flushing, on large surfaces, etc. automatically with the highest quality and precision, safe in the knowledge that the generator will provide optimal performance at every stage of the work.



Analysis of the EDM process carried out by the BES:

INDIVIDUAL SPARK CONTROL.

Measures all of the characteristics of each spark, ionisation time, discharge level, etc.

Detects the erosion conditions in each spark and, if necessary, takes protective measures.

TIMER CONTROL.

Assesses each timer, analysing previous values and adjusting the parameters to increase EDM performance.

MULTI-SPARK CONTROL.

Assesses groups of sparks and acts if necessary.

\ GENERATOR

A quick, accurate EDM process with a high-quality surface.



GREATER PRECISION.

The high-speed pulse technology included in **NXF** models improves the accuracy of work done in difficult flushing conditions.

This technology makes it unnecessary to use side flushing lances when machining grooves, eliminating the deformations caused by the dielectric flow from the lances in the eroded cavity and reducing electrode undersizing.



INCREASED MACHINING DEPTH WHEN MAKING GROOVES.

It is possible to make extremely deep grooves with the highest quality and precision.



A MORE HOMOGENEOUS FINISH ON LARGE SURFACES.

The high-speed pulse technology also helps you to obtain a more homogeneous finish on large surfaces.

The **ONA-S64** CNC for **ONA NXF** machines has technology tables specifically developed to achieve an excellent and homogeneous finish on large machining areas.



TECHNOLOGY TABLES AND STRATEGIES SPECIFICALLY FOR GROOVES.

The **ONA-S64** CNC comes with technology tables specifically for the machining of grooves.

The Strategy Generator Wizard for the automatic generation of programs also contains the necessary information to enable the operator to quickly and automatically generate the most suitable program to machine different types of grooves.

\ CONTROL

A CNC that allows you to work in 3D without limits.

A-SPACE FUNCTION.

The **ONA-S64** CNC has a new A-SPACE (EDM axis in SPACE) function, that enables any of the CNC's programmable EDM functions (spheres, cones, orbital, vectors, etc.) to be performed in any direction in space.

PROGRAMMABLE FIXED CYCLES:

- 45° Orbital Circular
- Orbital Circular.
- Orbital Square
- 45° Orbital Square.
- Vector EDM.
- Increasing/decreasing square cone EDM.
- Increasing/decreasing circular cone EDM.
- Orbital EDM with ANGLE function.
- Increasing/decreasing sphere EDM.

Functions



>> ORBITAL EDM WITH ANGLE FUNCTION



>> 45° SQUARE EDM



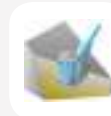
>> HELICAL EDM



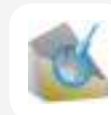
>> 45° CIRCULAR EDM



>> VECTOR EDM



>> VECTOR EDM



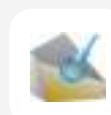
>> INCREASING SPHERE EDM



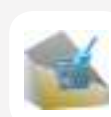
>> DECREASING SPHERE EDM



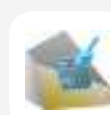
>> INCREASING CIRCULAR CONE EDM



>> DECREASING SQUARE CONE EDM



>> DECREASING SQUARE CONE EDM



>> DECREASING CIRCULAR CONE EDM

3D SETUP: Simplifies and reduces fine tuning time

THE 3D SETUP MODULE INTEGRATED INTO

The **ONA-S64** CNC covers an extensive range of automatic measuring cycles that help to simplify the fine tuning of workpieces and electrodes on the machine.

The 3D SETUP module allows you to perform:

MANUAL MOVEMENTS:

Using the remote control you can perform movements on the machine according to the EDM axis defined and the main axes, and it is possible to perform all types of centring in the space, with the associated manual movements.

AUTOMATIC CENTRING IN ANY DIRECTION IN SPACE.

It is possible to automatically perform centring on the inside and outside of workpieces and on their corners, faces and midpoints, on any plane defined and in any direction in space.

AUTOMATIC ALIGNMENT OF THE MACHINE AXES AND THE WORKPIECE AXES,

Thanks to the automatic measuring of the workpiece's deviation from the main axes. 3D SETUP also automatically corrects the program, the orbits and the C-axis.



\ CONTROL

Strategy Generator Wizard:

STRATEGY GENERATOR WIZARD

The strategy generator wizard analyses the optimal EDM procedure, determining the start and finishing processes and the oversizing of the electrodes, automatically generating the most suitable program.

The operator must complete a simple questionnaire, specifying:

>>

With this system, once a minimum of data has been entered, the SGW analyses the work and automatically generates the program. The automatic strategy system puts all of ONA's experience at the fingertips of the user, reducing their training time to a minimum. Users who want to integrate their own experience into the CNC are able to create their own technology tables and use them to prepare the automatic strategies.



PROJECT GENERATOR WIZARD.

Performing work that entails the use of multiple electrodes requires long and complicated programs to be generated. To simplify the programming and management of this type of work, the new ONA-S64 CNC comes with a Project Generator Wizard.

The PGW is a strategy and electrode manager that allows you to intuitively associate:

- Electrode characteristics files.
- Electrodes to be used.
- EDM to use with each electrode.

The PGW uses a tree structure to display a 01 summary of the work generated, allowing you to quickly access any file from the tree.

>>

This also presents a summary of the work to be done, allowing you to edit strategies, programs, offset files, technologies, etc. with its assistance.

The operator can also swap programs, strategies, instructions, etc. between different projects. Thanks to this tool it is possible to manage complex tasks logically, quickly and flexibly.



>>

Electrode angle location tables, flushing parameters, technology tables, etc.

\ CONNECTIVITY AND AUTOMATION

CNC equipped with Ethernet connection, USB, messages to mobile phones,...

MULTI-TASK CONTROL.

While the program is running, the control displays, in real-time, the orbital paths, the efficiency with which the generator is performing and a visualisation of multi-cavities and contouring. It is also possible to simultaneously edit programs, technologies, strategies, projects,...

>>

Thanks to these connections, the ONA NXF machine model allows you to automate all types of job, connecting the machine to robots, electrode changers, etc. And to remotely view the work performed by the machine enabling multi-tasking.



ETHERNET



USB



ETHERNET CONNECTION AND AUTOMATIC MESSAGE-SENDING.

The RJ45 connector and Ethernet connection that

come as standard with **ON A NXF** machines offer users improved automation and control of the machines, allowing them to be integrated into a LAN (Local Area Network).

The **ON A-S64** CNC allows you to send automatic messages to several email addresses specified by the user, with the option to attach technology files, compensations, the log for a workpiece,...

It also allows you to program alert messages while a program is running, so that you receive remote updates on the status of the work throughout.



MESSAGES
TO MOBILE
PHONES

- Adjuntar ficheros de tecnología
- Compensaciones
- Histórico de una pieza.

\ FEATURES OF THE CNC

4 axes simultaneously controlled by CNC.

Burning Expert System: 100% unsupervised operation.

Linear, circular, helical interpolation.

Assisted programming language or ASCII.

The X, Y, Z axes can be swapped between programs.

A-SPACE function (Axis for EDM in SPACE), which enables the various EDM functions (spheres, cones, orbital, vectors, erosion, etc.) to be performed in any direction in space.

All of the generator's parameters can be adjusted and/or modified with the program.

Alarms and diagnostics are displayed with explanatory text (records of programs, orbit times, process times, etc.).

Graphical representation: Displaying orbital paths – Multi-cavities – Contouring – The efficiency of the Burning Expert System (BES).

Execution types: Normal – Vacuum – Simulation –Block to block – Return by profile.

Positioning: Automatic by program, Manual continuous, Manual incremental.

Coordinates systems: Cartesian and polar (vectors).

Strategies: automatic generation of programs.

User technology tables.

Technology tables and strategies specifically for **grooves.**

Specific technology tables for large machining areas.

Machine zero: can automatically be positioned on the X, Y, Z and C axes.

Centring: automatic inside, outside and on faces, on any plane defined by main X, Y and Z axes.

3D SETUP: automatic measuring cycles in any direction in space: Automatic centring inside and outside, on the angles, faces and midpoint of a workpiece, in any direction in space.

– Automatic alignment of the machine axes and workpiece axes and automatic correction of the program, of the orbits and of the C-axis.

– Manual movements according to main axes and EDM axis.

Locking of the C-axis by program.

Programmable centring tolerance.

Programming system: Absolute, Incremental.

Units system: Metric, Inches.

Axis functions: mirror (separate X,Y, Z), Movement (every 0.001 mm), Program rotation (0.001°).

Macros and sub-routines.

Pauses: programmable according to times or the status of input signals.

Definition of the usable working area of the user.

Anti-collision: prevents any electrode breakage in the event of a collision with a workpiece.

Bifurcation: conditional or unconditional. Repeat function.

Correction of electrode centring errors.

System for filing various types of files: programs, technologies, offsets, crossings, compensations, logs. File browser.

Compensations:

- Compensation of the GAP (vertical and horizontal)
- Compensation of the radius of the electrode during contouring
- Compensation of positioning errors on X, Y and Z axes.

Option to **program existing external automation** systems using the user input/output system.

Programmed fixed cycles: Circular and square orbital expanding to 45°. / Vector EDM. Increasing/decreasing square and circular cone EDM. Increasing/decreasing sphere EDM. Internal/external helical EDM. Orbital EDM with ANGLE function (underwater injection function).

Automatic return.

Auto-off when work is completed, in an alarm situation, for scheduled stoppages.

Restart work after a power failure.

Timer: Automatic, Programmable.

Flushing: Programmable, Continuous, Intermittent, Suction.

External communication: USB (mobile flash disk), RJ45 connector and Ethernet.

SMTP mail client to send emails.

With a suitable network infrastructure, this allows messages to be automatically sent to mobile telephones.

TECHNICAL SPECIFICATIONS



SPECIFICATIONS

ONA NX3F

ONA NX4F

MACHINE

Travel on the X-axis	400 mm	600 mm
Travel on the Y-axis	300 mm	400 mm
Travel on the Z-axis	300 mm	400 mm
Resolution of positioning XYZ	0.001 mm	0.001 mm
Resolution of positioning C	0.001 °	0.001 °

WORK TANK

Tank dimensions		920x590x350 mm	1250x780x490 mm
Table dimensions		600x400 mm	800x600 mm
Max. distance between head and table	Without C-axis	550 mm	680 mm
	With C-axis	470 mm	600 mm
Max dielectric height		280 mm	430 mm
Permissible weight on the table		750 kg	1500 kg
Max. electrode weight		50 kg	75 kg
Max. electrode weight (with C-axis)		25 kg	50 kg
Perm. weight on electrode changer		50 kg	50 kg

RATING	ONAM NX3F	ONAM NX4F
GENERATOR		
Current	100 Amp	100 Amp
Intensidades programables	12 N°	12 N°
Programmable currents	80-120-160-200 N°	80-120-160-200 N°
Pulses	Between 1 and 6,500 microseconds	
Pauses	Between 1 and 6,500 microseconds	
Max. start-up capacity in copper	500 mm ³ / min	500 mm ³ / min
Max. start-up capacity in graphite	600 mm ³ / min	600 mm ³ / min
Volumetric wear in copper	0,2 %	0,2 %
Volumetric wear in graphite	0,1 %	0,1 %
Minimum roughness	0,1 Ra	0,1 Ra

CNC

Screen	15" TFT colour
Cursor control	Trackball
Keyboard	Flat, dirt-free
Remote control	Standard

DIELECTRIC

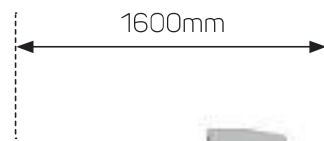
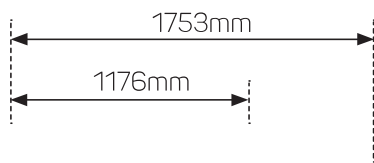
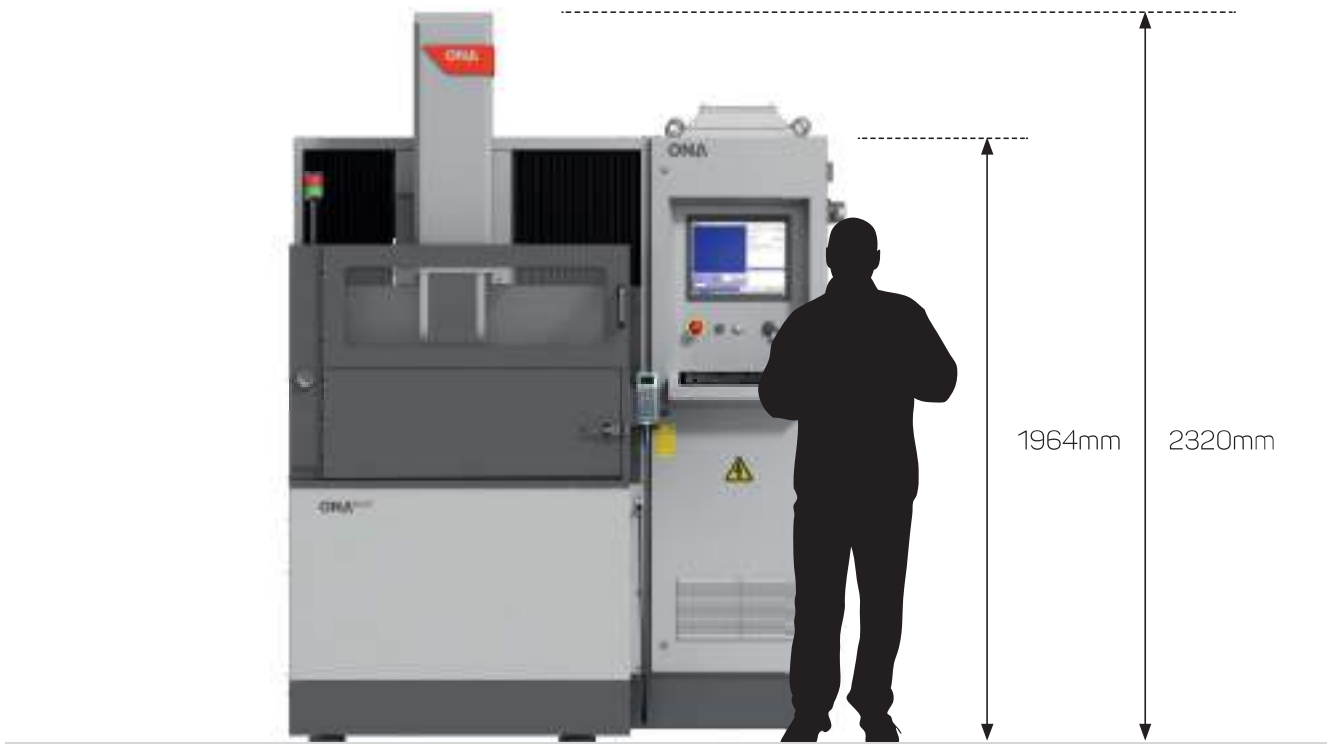
Total capacity	370 litres	650 litres
Programmable currents	2 paper cartridges. (3-5 microns)	
Filtration system	1.750x1.590x2.210 mm	2.123x4.441x2.700 mm
Machine weight	2.500 kg	4.500 kg
Maximum area	1.750 x 1.590 mm	2.123x4.441 mm

Opciones

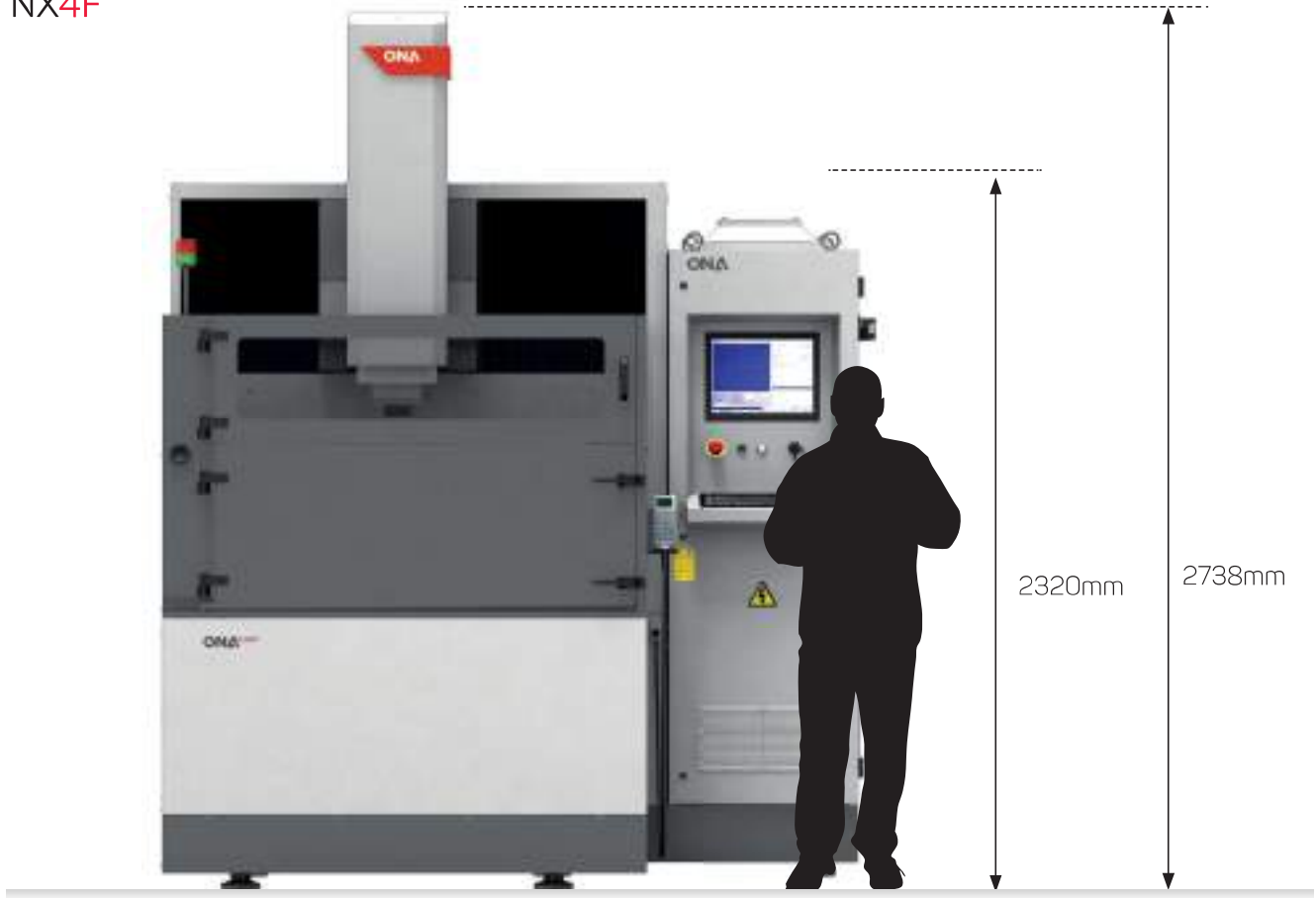
- C Axis
- 5 or 40-position electrode changer
- Dielectric cooling system

\ DIMENSIONS

NX3F



NX4F





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LOOK NO FURTHER,
THE FUTURE IN EDM
IS HERE

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