



 QXF

QX3F
SINKING EDM QXF
RANGE CATALOGUE

ONA, WE ARE EDM

KNOWLEDGE AND EXPERIENCE

at the client's service.

At **ONA** we are pioneers in EDM technology. Our over **65 years of history** have made us the most specialised manufacturer in the world. With ONA, the client is guaranteed a highly qualified team, experts in the manufacture of EDM machines and precision assemblies. A history full of technological advances and improvements with over **15,000 machines installed** all over the world. We are present in 60 countries thanks to a wide network of **distributors around the world ensuring fast and efficient service at any time.**

Our long experience makes us a reference in EDM in the most competitive industrial sectors:



AUTOMOTIVE



ENERGY



AEROSPACE



MOULD



AERONAUTICS



over **65 years**
of history.

over **15.000**
machines installed.

present in more than
60 countries.

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MECHANICS

HIGH PRODUCTIVITY AND ULTRA-COMPACT ELECTRICAL DISCHARGE MACHINE

with the new outstanding
ON A QX generator.



QX3F
OUTSTANDING GENERATOR

QUICK AND EASY TO OPERATE.

The ON A QXF 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 ON A QXF range is a new concept in machinery, based on an industrial eco-design, where simplicity and efficiency come first.

MINIMUM SURFACE, MAXIMUM RELIABILITY.

The ON A QXF range responds to a new conception of machine based on the ideal that they are predominantly simplistic, with an efficient design while at the same time that offers the operator a substantial improvement in comfort.

High load capacity on the table.

The fixed-bed plate mechanical design of QXF 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.

GUARANTEED PRECISION. HIGH RIGIDITY AND STABILITY.

The ON A QXF 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.

Direct measurement of positioning on the X, Y and Z axes.

With ON A QXF 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.



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.



GENERATOR

OUTSTANDING GENERATOR.

100% digital.
100% configurable.
100% programmable.

The generator was designed to be fully configurable and programable. Its technology will effectively adapt to the different current and future applications, and will always be compatible with subsequent versions.

INCREASED PROFITABILITY FROM SAVINGS IN ELECTRODES.

The new Expert System optimises the erosion process and adapts it to the load conditions of each moment. In addition, it catalogues each spark according to its quality and eliminates those that fail to contribute to quality machining. This results in great improvements in productivity.

THE BEST SOLUTION OF THE MACHINING OF POOR CONDUCTIVE MATERIALS.

Thanks to the new design in intensity control, optimum energy density can be achieved for the characteristics of each material, thus avoiding possible damage caused by an excess of temperature.

It is particularly suited to poor conductive materials like tungsten carbide, SiC, SiSiC, CBN, CMC ceramics, Moldmax, polycrystalline diamond, etc.

74	183,85	1,7
Ct		
TUNGSTEN CARBIDE		
3380	5930	19,26

Tungsten carbide

29	63,54	1,9
Cs		
CERAMICS SiC		
1083	2595	8,96

Ceramics SiC

03	05,83	1,9
Si		
SiSiC		
1983	3417	9,11

SiSiC

14	28,086	1,8
Cb		
CBN		
1410	2680	2,33

CBN

95	98,478	1,3
Cm		
CMC		
1599	2589	20,3

CMC

04	07,08	1,6
Mo		
MOLDMAX		
3306	5069	2,58

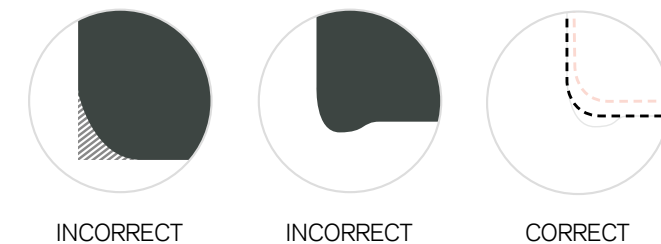
Moldmax

98	3,569	1,4
Dp		
POLYCRYSTALLINE DIAMOND		
4869	2658	2,73

Polycrystalline diamond

PERFECT PRECISION IN FINISHES, CORNERS AND EDGES.

Monitoring of over 30 erosion parameters, by means of an intuitive, user-friendly interface, guarantees maximum quality and efficiency of the process. With the new special control points system, we achieve maximum precision, and minimise the wear of graphite electrodes, thus preventing build-up on the corners and edges of the electrodes.



Perfect results on corners and edges thanks to special control points system.

Maximum uniformity of surface finish.

We meticulously control each discharge in terms of time, manner and scope, with a resolution of 0.1 Amperes. These excellent results can also be obtained on large surfaces thanks to an adaptive speed and acceleration system to obtain gentle movements, thus avoiding vibration in large surface area electrodes.

More precise micro machining. Improved precision of the internal radius of up to 5 microns.

The new digital generator is capable of regulating intensity with great resolution, and can handle technology for electrodes with extremely small subdimensions (0.030 – 0.015 mm) and handle machining of internal radii of up to 0.005mm.



CONTROL

A CNC THAT ALLOWS YOU TO WORK IN 3D WITHOUT LIMITS.

3D SETUP:
Simplifies and reduces
fine tuning time.



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.

Strategy and Project 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 automatic strategy system puts all of ONA's experience at the fingertips of the user, reducing their training time to a minimum.

PROJECT GENERATOR WIZARD.

Performing work that entails the use of multiple electrodes requires long and complicated programs to be generated.

To simplify the programming the PGW is a strategy and electrode manager that allows you to intuitively associate electrode characteristics files, electrodes to be used and the EDM process.

The operator must complete a simple questionnaire, specifying:

1 CHARACTERISTICS OF THE WORK

- Depth, type of cavity, material electrode/ workpiece, EDM axis, electrode to use.
- Selection of the working criteria: speed, surface homogeneity, minimum wear.

2 TECHNOLOGY

- Definition of roughing parameters:
 - Directly inserting the initial VDI.
 - Defining the front area of the electrode.
 - According to given undersizing value.
- Definition of finish parameters:
 - Inserting the final VDI.
 - Defining the electrode's total surface area.

3 TYPE OF FINISH STRATEGY

- Square, circular orbital.
- Increasing, decreasing spheres.
- Finish of edges. EDM, etc..

4 EDM CHARACTERISTICS

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

>> Once this data has been entered, the SGW analyses the work and automatically generates the program.

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.

CONNECTIVITY AND AUTOMATION

CNC EQUIPPED WITH ETHERNET CONNECTION, USB, MESSAGES

to mobile phones, ...

ON A

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,...

ETHERNET CONNECTION AND AUTOMATIC MESSAGE-SENDING.

The RJ45 connector and Ethernet connection that come as standard with ONA QXF machines offer users improved automation and control of the machines, allowing them to be integrated into a LAN (Local Area Network).

The ONA-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.

>>

Thanks to these connections, the ONA QXF 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.



i



- Attach technology files
- Compensations
- Historical of a piece

The QX range's connectivity.



Connectivity and network operation. Ethernet connector, standard TCP/IP communication.



Different M2M connection options.



IoT ready, possibility to connect to other devices or platforms complying to Industry 4.0 standards.



The CNC includes a control and monitoring server allowing data and services to be offered to external clients via XML.



Plant Monitor, ONA Cloud Monitor... possibility of monitoring, registering data securely in the cloud or locally.



File transmission via FTP or FTPS.



Integration with main CAD/CAM software for simulation and automatic generation of programs.



TECHNICAL DATA

Features of the CNC

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 -.

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 E DM 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

ONAM QX3F

MACHINE	mm / Kgs	in (°) / lb
Travel on the X-axis	400 mm	15.7 in
Travel on the Y-axis	300 mm	11.8 in
Travel on the Z-axis	300 mm	11.8 in
Resolution of positioning XYZ	0.0001 mm	3.937 E-06 in
Resolution of positioning C	0.001 °	0.001 °

WORK TANK

Tank dimensions		920 x 590 x 350 mm	36.2 x 23.2 x 13.8 in
Table dimensions		600 x 400 mm	23.6 x 15.7 in
Max. distance between head and table	Without C axis	550 mm	21.7 in
	With C axis	470 mm	18.5 in
Max dielectric height		280 mm	11 in
Permissible weight on the table		750 kg	1653.5 lb
Max. electrode weight		50 kg	110.2 lb
Max. electrode weight (with C-axis)		25 kg	55.1 lb
Perm. weight on electrode changer		50 kg	110.2 lb

GENERATOR

Current	100 Amp	100 Amp
Programmable intensities	From 0 to 100 Amp	From 0 to 100 Amp
Max. start-up capacity in copper	550 mm³ / min	0.033 in³ / min
Max. start-up capacity in graphite	660 mm³ / min	0.04 in³ / min
Volumetric wear in copper	< 0.1 %	< 0.1 %
Volumetric wear in graphite	<0.05%	<0.05%
Minimum roughness	0.08-0.1 Ra	0.08-0.1 Ra

CNC

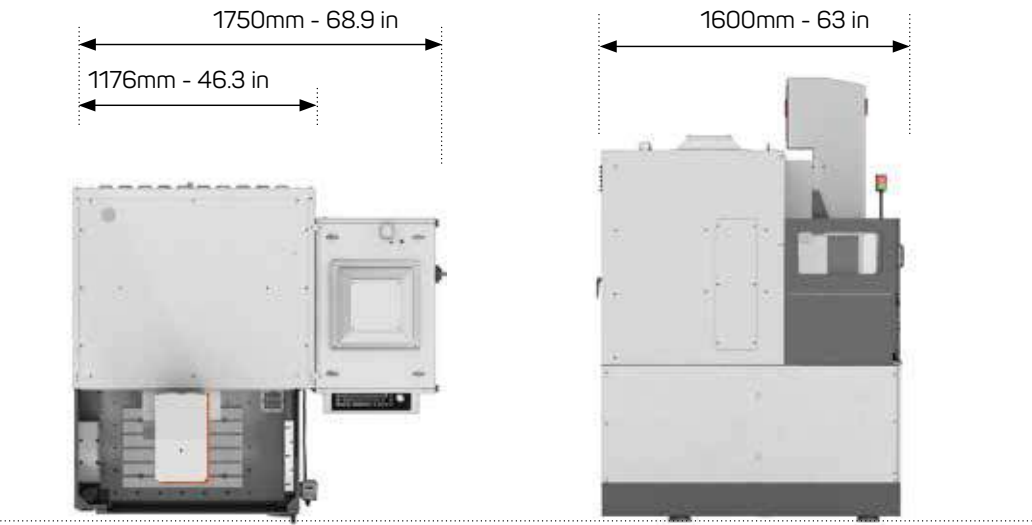
Screen	15" TFT colour	Total tank capacity	370 litres	370 litres
Cursor control	Trackball	Filtration system	2 paper cartridges. (3-5 microns)	2 paper cartridges. (3-5 microns)
Keyboard	Flat, dirt-free	Machine weight	2500 kg	5511.5 lb
Remote control	Standard	Maximum area	1750 x 1590 mm	68.9 x 62.6 in
		Max. Height	2210 mm	87 in

Options

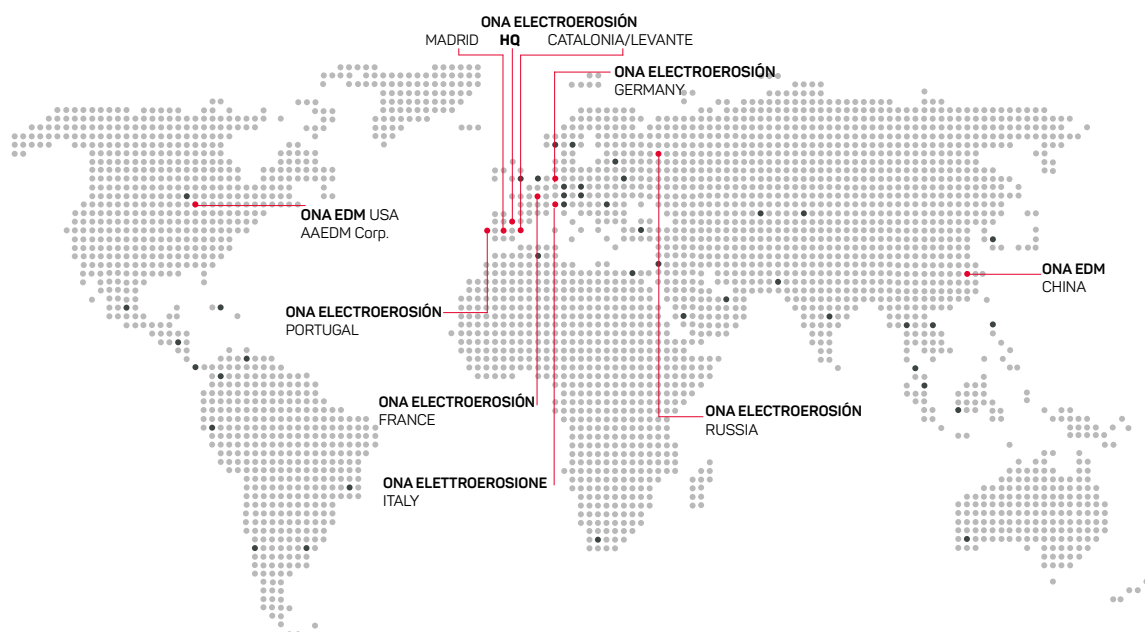
C Axis | 5 or 40-position electrode changer Dielectric cooling system

Dimensions

ONAM QX3F



We are at your service anytime and anywhere in the world



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