create your future

Sodick

Linear Motor Drive Wire-cut EDM

VN400Q/VN600Q

Core Technology

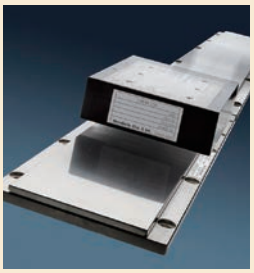
Five proprietary core technologies are engineered in-house, achieving exceptional levels of precision machining on a global scale.

Tech 1 & 2 NC Power Supply Unit and Discharge Unit

Sodick's innovative VN wire EDM series incorporates the advanced "LN3W series" power supply unit, renowned for its capacity for high-speed, high-precision, and highly efficient machining. The remarkable performance of the LN3W series power supply is enhanced by its 1Gb/sec communication technology and the utilisation of "Perfect Active Control," all facilitated by a contemporary in-house designed NC system operating on the Windows Operating System. The user interface is further elevated through a 15" colour touch screen, ensuring ease of use and operation.

Tech 3 Linear Motor

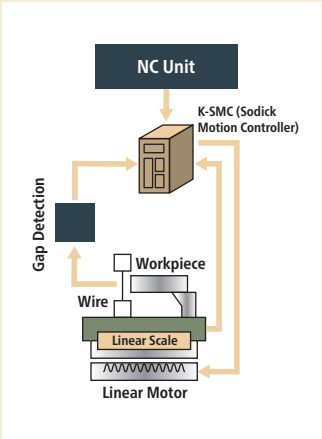
The most outstanding features of the Sodick in-house developed and manufactured Linear Motors are high-speed axis motion and quick response, which result from wear-free motion and without the need for old-fashioned ball screws. Conventional drive systems use ball screws to convert the rotational motion of the motor into the linear motion of the axis stroke, leading to the unavoidable deterioration in the response of high speed servo motors due to back-lash and mechanical lost motion. However linear motors directly provide motion to each axis without converting rotational motion of motor to linear movements.



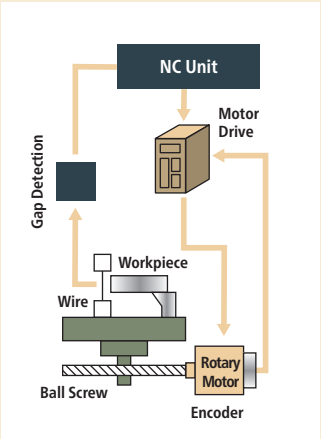
Tech 4 Motion Controller + Absolute Linear Scales

Introducing the Latest Sodick Motion Controller "K-SMC," now incorporated into the VN series. With an even quicker response time ranging from 0.4 to 1 micro-second, this advanced Motion Controller is developed by Sodick's in-house R&D division situated in Silicon Valley, USA. It is purposefully engineered to not only meet but exceed the rigorous demands of today's and tomorrow's EDM processes. Seamlessly integrated into the machine's generator, the K-SMC governs axis motion and meticulously tracks spark gap adjustments.

The introduction of new advanced absolute linear glass scales has eliminated the need for referencing. This advancement ensures constant positional control and leads to reduced setup time.



Linear Motor Drive



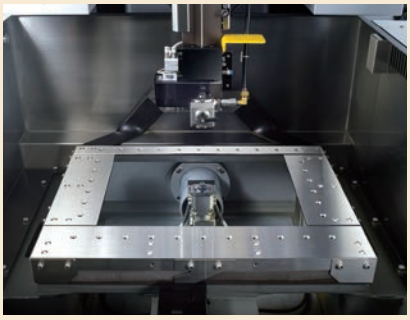
Conventional Ball Screw

Tech 5 Ceramic Components

Leveraging the advantages of ceramics, the VN Wire EDM Series enhances its performance through strategic implementation in vital components, including the upper and lower guide assemblies, as well as work-table supports. Ceramics have a low coefficient of thermal expansion, lightweight composition, high rigidity, resistance to aging, and exceptional electrical insulation properties. These attributes collectively position ceramics as the ideal material for a pioneering Wire EDM Machine.

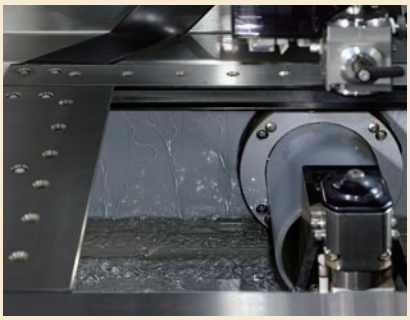
Commencing with the inception of electrical discharge circuits, Sodick persists in unwavering endeavours toward advancing advanced EDMs through relentless research and development. Sodick's ethos revolves around persistently pursuing the highest precision, speed, and machining versatility, all aimed at delivering the utmost quality machines to its valued customers.

Sodick has integrated its outstanding technologies—Power Supply Units, Discharge Units, Linear Motors, Motion Controllers, and Fine Ceramic Components—into its core innovation. These strides have firmly propelled Sodick at the pinnacle of EDM technologies.



Four-Sided Workstation

- Workpieces can be loaded with ease, and maintenance can be conveniently carried out from beneath the workpiece.

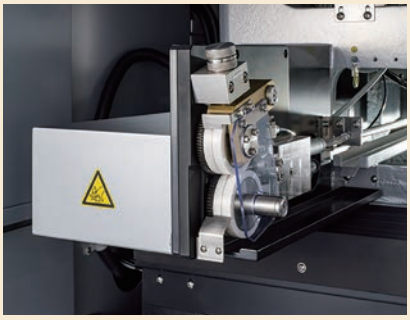


Slide Plate Maintenance

- Guards against sludge buildup on the slide plate.
- Ensures consistent high-precision machining.
- Contributes to reduced maintenance duration.

Triple Filtration System

- Filtration units designed to purify machining fluid and accumulate sludge.
- Enhancing the number of filters to three reduces the need for frequent replacements, allowing for extended periods of uninterrupted machining.
- Enhances the cleanliness of the freshwater tank by boosting filtration capacity.



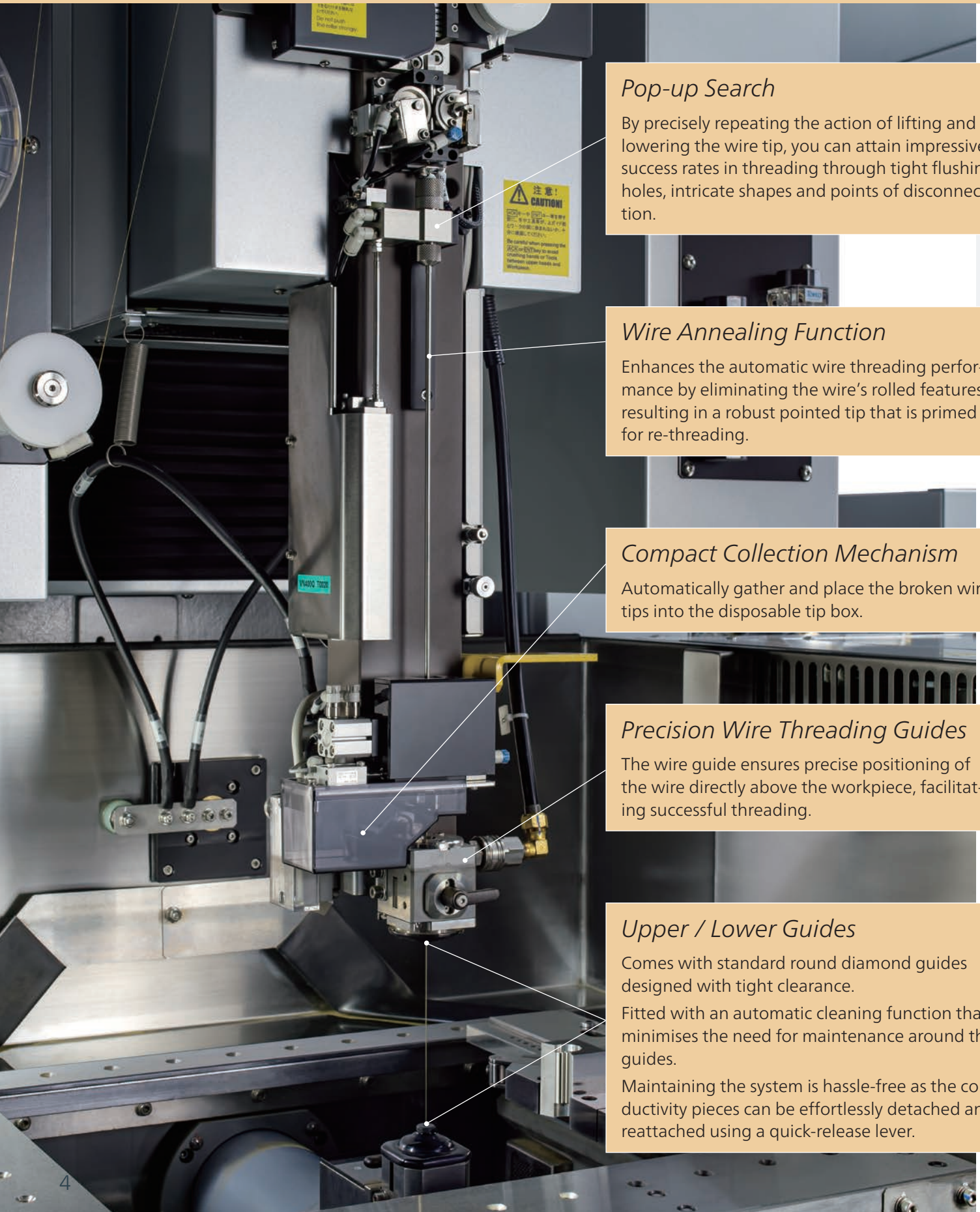
Wire Collection System

- Gathers wire within the rear-mounted machine bucket.
- The wire ejection unit uses a large ceramic roller that's very durable and resistant to wear

Improved Accessibility

- The machining tank door is about 60 mm lower than the work stand's upper surface. This allows easy access to the workpiece using a hand lift while staying close to the work stand.

Fixed Jet AWT



Pop-up Search

By precisely repeating the action of lifting and lowering the wire tip, you can attain impressive success rates in threading through tight flushing holes, intricate shapes and points of disconnection.

Wire Annealing Function

Enhances the automatic wire threading performance by eliminating the wire's rolled features, resulting in a robust pointed tip that is primed for re-threading.

Compact Collection Mechanism

Automatically gather and place the broken wire tips into the disposable tip box.

Precision Wire Threading Guides

The wire guide ensures precise positioning of the wire directly above the workpiece, facilitating successful threading.

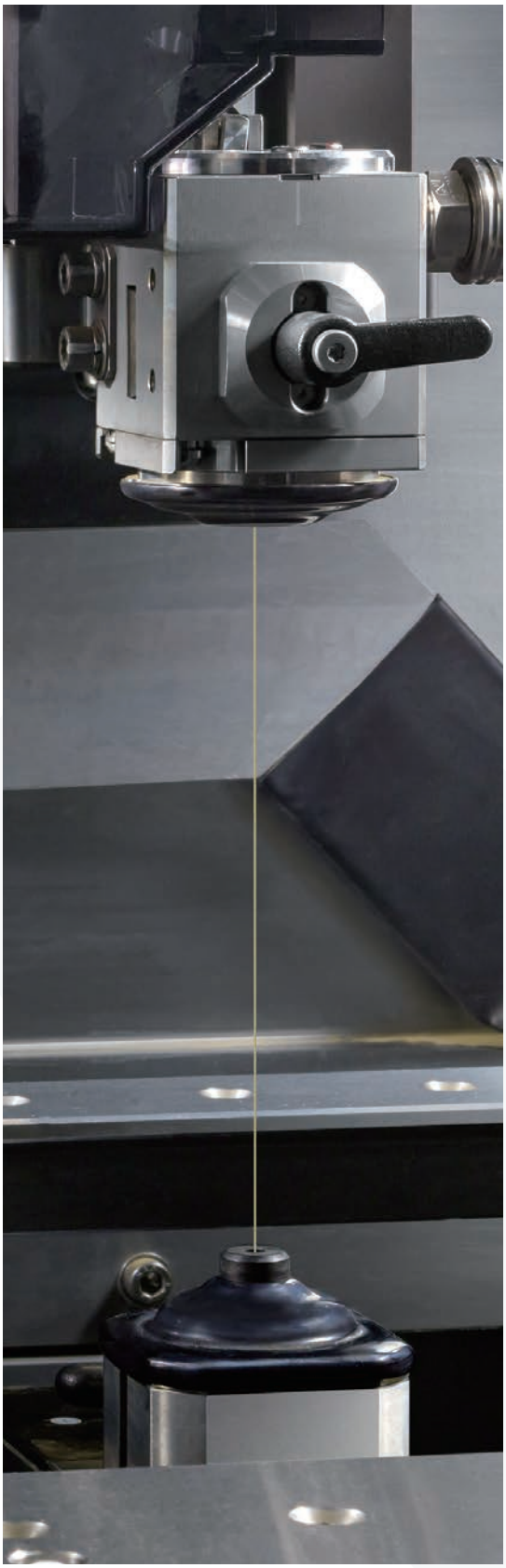
Upper / Lower Guides

Comes with standard round diamond guides designed with tight clearance.

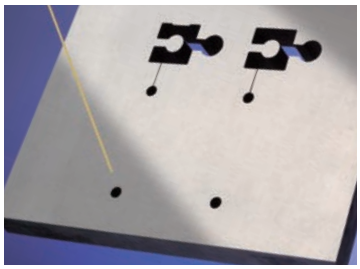
Fitted with an automatic cleaning function that minimises the need for maintenance around the guides.

Maintaining the system is hassle-free as the conductivity pieces can be effortlessly detached and reattached using a quick-release lever.

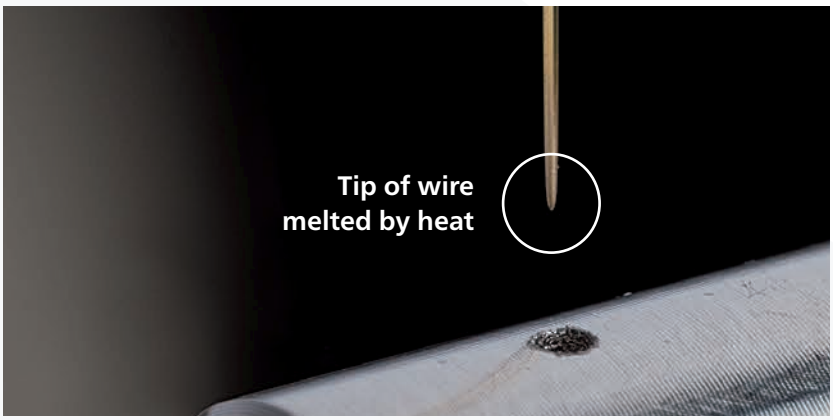
Automatic Wire Threading Unit



- *The wire is threaded automatically into the next starting hole.*
- *Enables continuous machining for unmanned operation.*
- *Enhanced automatic wire threading performance, whether in the air or submerged.*



- The quick-release locking nut enables faster and easier movement of the conductivity piece position.
- Improves the automatic wire threading performance even in workpiece shapes where the guide cannot approach the pilot hole.
- The thermal cut ensures wire straightness.
- Anneal length is longer than that of conventional machines, supporting machining of higher plate thickness.

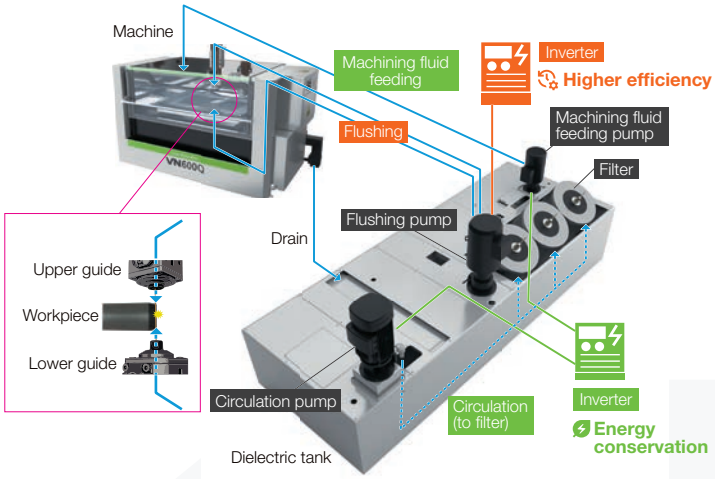


Optimum control of machining fluid

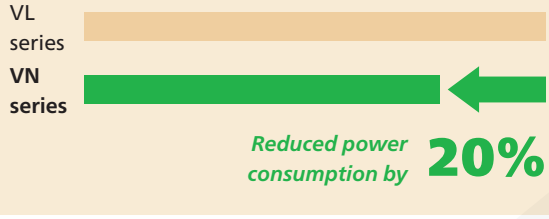
Energy-saving Pump System

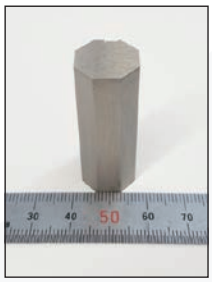
Around 70% of the electrical energy consumed in wire-cut EDM is used by the dielectric treatment system. To address this, a machining fluid control circuit is now included as standard, which reduces the energy needed to drive the pump for dielectric processing. This is achieved by utilising an inverter to control the vertical flushing flow rate during machining. As a result, this feature achieves roughly a 20% reduction in power consumption during machine standby, as compared to conventional models.

(* Compared to our model case)



Comparison of power consumption





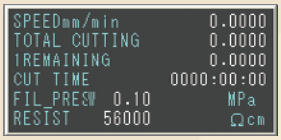
Example of model case machining octagonal punch of 40 mm	
Machine	VN400Q / VL400Q
Workpiece material	Steel
Thickness	40 mm
Wire	ϕ 0.25 mm (Brass)

Enhanced Open Cut Performance

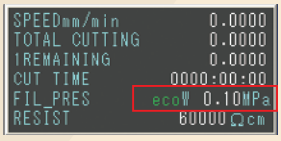
Benefiting from enhanced nozzle flushing performance, the VN series with the LN3W controller amplifies open cut cutting speed by 5~15%

*Comparison with VL Series-based on our designated environment

When the machine is in energy-saving mode, NC displays "eco" to raise the awareness of energy conservation among workers.



Normal operation



Energy-saving operation

Options

Complete Rotary Indexing Functionality

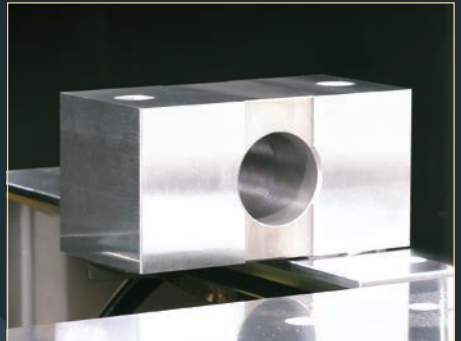
Sodick's in-house developed proprietary Rotary Table introduces an optional axis with indexing capabilities.

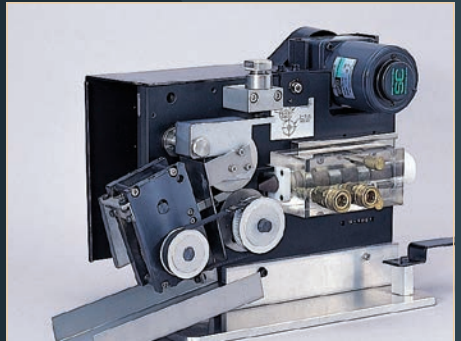
AVC

Higher wire alignment option with increased accuracy, fully automated for specialised applications where it's required.

L-cut

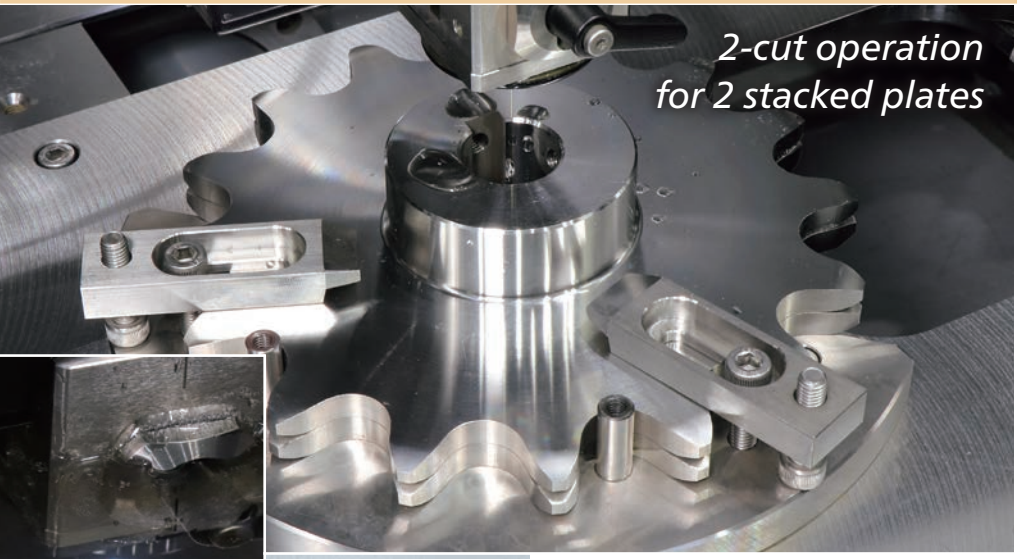
It cuts used wire into small pieces for longer run times and easy wire disposal supporting ϕ 0.15 mm to 0.3 mm.

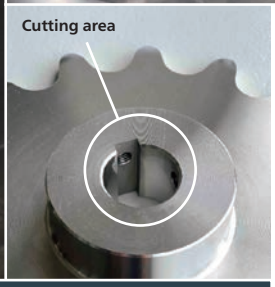




Samples

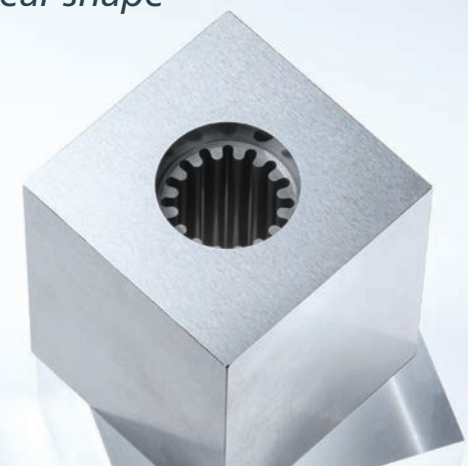
Unrivalled performance supports various machining and solves customer problems.





Key way	
Workpiece material	Steel
Thickness	35 mm × 2 plates
Surface roughness	Ra 1.264 µm
Wire	ϕ 0.20 mm (Brass)

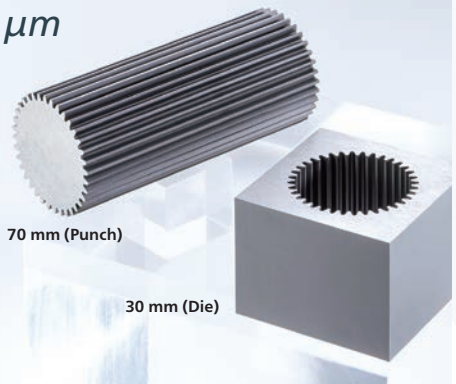
Gear shape



Double floating gear shape	
Workpiece material	Steel
Thickness	50 mm (Counterbore Top: 5 mm, Bottom: 10 mm)
Surface roughness	Ra 0.40 µm
Wire	ϕ 0.25 mm (Brass)

Gear shape punch & die	
Workpiece material	Steel
Thickness	70 mm (Punch) 30 mm (Die)
Surface roughness	Ra 0.38 µm (Punch) Ra 0.34 µm (Die)
Wire	ϕ 0.20 mm (Brass)

Machining accuracy ± 5 µm

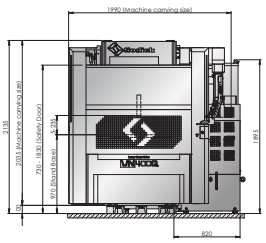


High thickness 10° taper

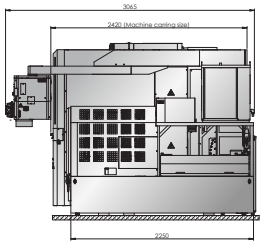
Slide interlock	
Workpiece material	Steel
Thickness	100 mm
Surface roughness	Ra 0.38 µm
Wire	ϕ 0.25 mm (Brass)

Specification

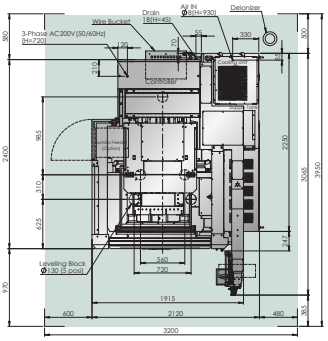
VN400Q



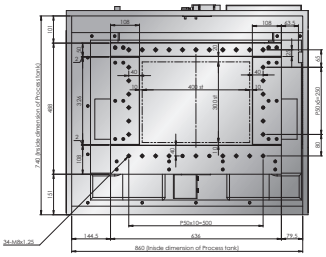
Front View



Side View

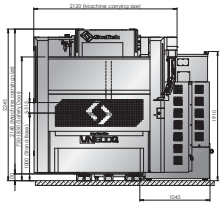


Top View

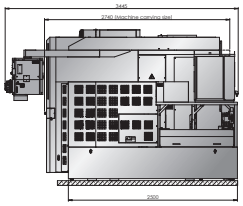


Work-tank

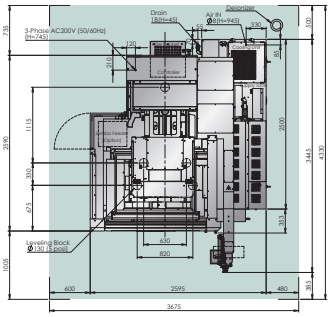
VN600Q



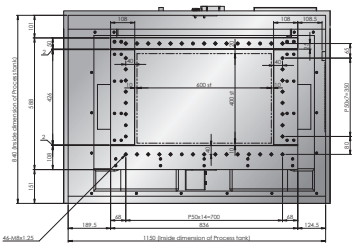
Front View



Side View



Top View



Work-tank

Machine Tool	VN400Q	VN600Q
X axis travel	400 mm	600 mm
Y axis travel	300 mm	400 mm
Z axis travel	230 mm	310 mm
U x V axis travel	90×90 mm	90×90 mm
Taper angle	±15° (Workpiece thickness: 120 mm)	±15° (Workpiece thickness: 120 mm)
Work-tank dimensions (W x D)	860 x 740 mm	1,150 x 840 mm
Max. workpiece weight	500 kg	850 kg
Wire diameter	ϕ0.1 - ϕ0.3 mm	ϕ0.1 - ϕ0.3 mm
Wire tension	3~23 N	3~23 N
Max. wire speed	Max. 420 mm/sec	Max. 420 mm/sec
Distance from floor to table top	970 mm	1,000 mm
Machine dimensions (W x D x H)	2,120 x 3,065 x 2,135 mm	2,595 x 3,445 x 2,245 mm
Machine installation dimensions (W x D)	3,200 x 3,925 mm	3,675 x 4,330 mm
Machine tool weight	3,200 kg	3,684 kg
Total power input	3-phase 50/60 Hz 11.5 kVA	3-phase 50/60 Hz 11.5 kVA

Dielectric Tank	VN400Q	VN600Q
External dimensions (W x D x H)	820 x 2,250 x 1,895 mm	1,045 x 2,500 x 1,910 mm
Capacity	635 Liter	970 Liter
Empty weight	450 kg	510 kg
Filtration method	3 replaceable paper filters (internal pressure)	3 replaceable paper filters (internal pressure)
Deionizer	Ion-exchange resin (18 Liter spec.)	Ion-exchange resin (18 Liter spec.)

The dielectric chillers on Sodick machines contain either fluorinated greenhouse gas R410A or R407C. | Due to ongoing research, specifications are subject to change without prior notice.

Sodick

create your future

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