

August 23, 2022

New finished goods

Supports high-precision parts processing, such as medical care equipment and aerospace components, and mold machining

**Entry model of linear motor drive wire-cut EDM
Announcement to launch “VN400Q/VN600Q”**

Sodick Co., Ltd. has developed and launched the entry model “VN400Q/VN600Q” of the linear motor drive wire-cut EDM, as a new machine that corresponds to precision parts machining, which has become smaller and more precise in recent years.

In the medical care equipment and aerospace industries, there is an increasing demand for efficient mass processing of complex shapes. Demand for linear motor drive wire-cut EDM with excellent cost performance is also increasing for general molds. In order to respond to such demands in the market environment, we have decided to launch the “VN400Q/VN600Q.”

The finished goods are equipped with all of Sodick’s cutting-edge technologies, such as the linear motor drive system, tension servo function, automatic connection device (FJ-AWT)^{*1}, accurate thermal displacement correction function (TH COM: thermal commit)^{*1}, dynamic shape first (DSF) function^{*1} that automatically responds to changes in the thickness of machined plates, ceramic stand, etc., as standard equipment, while the power supply and dielectric tank auxiliary units are optimally arranged to save installation space. (*1: Standard specification for domestic use in Japan)

“VN400Q/VN600Q” will be exhibited in “IMTS2022” to be held in Chicago, USA from September 12 to 17, 2022, and “JIMTOF2022” to be held in Tokyo from November 8 to 13, 2022.

■ Appearance of “VN400Q”



■ Planned sales price and target production volume

Standard price: VN400Q: 15 million yen~ (excluding tax), VN600Q: 17 million yen~ (excluding tax)

Target production volume: 120 units/year (VN400Q/VN600Q series)

■ Main specifications of “VN400Q/VN600Q”

● Main unit

Movement distance of each axis (X axis x Y axis x Z axis)	400×300×230 [600×400×310] mm
Max. workpiece size (W x D x H)	830×700×225 [1100×820×305] mm
Work tank inner dimensions (W x D)	860×740 [1050×840] mm
Max. workpiece weight	500 [850] kg
Wire electrode diameter	φ0.1~φ0.3 [φ0.1~φ0.3] mm
Max. taper angle (Thickness: 100 mm)	±15° [±15°]
Machine tool dimensions (W x D x H)	2070×2935×2135 [2615×3265×2245] mm
Machine tool weight	2920 [3280] kg
Total power capacity	11.5 [11.5] kVA

* [] is VN600Q specification.

● Power supply unit

Power requirement	200/220 V 50/60 Hz
NC unit	Multi-tasking OS, K-SMC-LINK method
No. of simultaneous control axes	Max. 4 axes (option: max. 8 axes)

■ Main features of “VN400Q/VN600Q”

- ① Achieves high-precision machining with 4-axis (XYUV axes) linear motor drive system
- ② High-rigidity mechanical structure using the latest design technology and accurate thermal displacement correction function
- ③ Equipped with automatic wire threader (FJ-AWT: Fixed Jet Automatic Wire Threader) as standard
- ④ Various mechanisms and functions that increase production efficiency at the processing site
- ⑤ Equipped with ceramics as standard to achieve stable fine discharge
- ⑥ New “LN3W/LP3W power supply” and automatic programming function “HeartNC”
- ⑦ Reduced electricity consumption
- ⑧ Recycling (environmental circulation) system using genuine supplies

■ Detailed explanation

① Achieves high-precision machining with 4-axis (XYUV axes) linear motor drive system

As an entry model of our wire-cut EDM, 4 axes of X, Y, U, and V are equipped with in-house developed and manufactured linear motors. The linear motor drive system has excellent movement speed and positioning accuracy, and since there is no mechanical contact, it maintains high responsiveness and long-term stability, maintainability, and reliability.

In addition, it is an entry model but equipped with a linear scale which is available as an option on general machine tools as a standard feature, making possible to achieve a higher level of machining accuracy.

② High-rigidity mechanical structure using the latest design technology and accurate thermal displacement correction function

The high-rigidity mechanical structure and accurate thermal displacement correction function (TH COM: Thermal Commit) that have been well received in the high-end machine AL series are adopted. This provides more stable accuracy even during long-term machining.

③ Equipped with automatic wire threader (FJ-AWT: Fixed Jet Automatic Wire Threader) as standard

By improving the annealing and thermal fusing performance and increasing the annealing length by 13% compared to conventional products, the straightness of the wire is increased. It is now possible to support stable automatic wire threading for thicker plates. By finely repeating the pop-up search operation that pulls up and lowers the wire tip, a high connection rate is achieved in narrow flushing holes, complicated shapes, and disconnection points.

④ Various mechanisms and functions that increase production efficiency at the processing site

Uses a “square” work stand that allows maintenance of the conductivity piece and processing of cores from underneath the workpiece. Eliminates the need for tools during maintenance of the conductivity piece, improves accessibility to the machining area, and supports work loading using a hand lift. In addition, consideration has been given to workability at the machining site to reduce the number of filters treated with dielectric to three to reduce the frequency of replacement, thereby achieving further improvements in production efficiency.

⑤ Equipped with ceramics as standard to achieve stable fine discharge

In addition to being hard, light, heat-resistant, and wear-resistant, the work stand uses ceramics manufactured in-house, which has insulation properties that are important for electrical processing machines, making it possible to work in the same setup, even with fine finishing, without the need for a dedicated insulation jig. This is our unique superior technology that effectively adopts ceramics, and this insulation enhances stability in the fine finishing area.

⑥ New “LN3W/LP3W power supply” and automatic programming function “HeartNC”

With new “LN3W/LP3W power supply,” we have improved the floating machining speed by 5% to 15% compared to conventional models.

Equipped with the machining support system “HeartNC” as standard, you can easily create programs, such as 4-axis machining (Top and Bottom are different shapes), involute gears, and free-form curves. In addition, data created by other CAD/CAM can be read in DXF format and easily output as a machining program, so even beginners can easily create programs for complex shapes.

Furthermore, “LP3W” power supply comes standard with a function that imports 3D models directly into wire-cut EDM, enabling an operating environment that does not require empirical rules. This makes it easy to create machining programs without knowledge of G-code, and improves productivity by avoiding simple human errors.

⑦ **Reduced electricity consumption**

Approximately 70% of the electric energy used in wire-cut EDM is consumed in the dielectric treatment system. With this in mind, a fluid treatment circuit that monitors the vertical flushing flow rate during machining to reduce the pump drive energy required for dielectric treatment has been included as standard equipment. This has enabled approximately 20% reduction of power consumption, including during standby, compared to the conventional models. (*Compared to our model case)

⑧ **Recycling (environmental circulation) system using genuine supplies**

Wire electrodes, filters, ion-exchange resins, and other supplies for wire-cut EDM are all valuable resources, but were usually treated as industrial waste. With regard to these consumables, we believe that it is important to take measures that are friendly to the global environment from the perspective of reuse, recycling, and resource reduction, and our company will establish a recycling system for supplies that is beneficial to energy conservation and eco-friendliness, and actively promote their use.