FOR IMMEDIATE RELEASE

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New Product Release
Linear Motor Drive High Speed / High Performance / High Precision Die-sinker EDM
Sodick Releases "AL40G / AL60G"

Sodick Co., Ltd. is launching the "AL40G / AL60G" from November 1, 2019 as a new linear motor drive die-sinker EDM which has been successful in precision molds and precision component machining, which mainly includes smart phones (high performance mobile phones), tablet terminals, and precision automotive parts, etc.

As a pioneer of electrical discharge machines, it has been 20 years since Sodick started selling the world's first electrical discharge machine equipped with the linear motor drive system. The total number of shipments of linear motor drive machines has now reached more than 50,000, and demonstrates its superiority all over the world. The AL40G / AL60G is a new generation precision die-sinker EDM integrated with linear motor control technology accumulated over 20 years, latest electrical discharge control technology, artificial intelligence (AI) functions, IoT platform, and temperature control system, etc.

The new AL40G / AL60G equipped with the newly developed "SP power supply" realizes improved machining accuracy, machining speed and machining quality in all electrical discharge machining areas from rough, semi-finishing to finishing by the newly developed various electrical discharge controls and electrical discharge circuits.
These models adopted a highly rigid machine structure which was ideally designed using state-of-the-art CAE analysis technology. The adoption of the "TH COM (Thermal Commit)" function in which precision corrections and various diagnostic functions can be used by sensing the temperature of each portion of the machine, minimizes the temperature change in installation environment and the thermal displacement during high-speed drive.

The new AL40G / AL60G is standardly equipped with a large 19-inch touch panel with excellent operability, and the condition adviser "LN Pro AI (LN Professional AI) which provides ideal machining conditions at all times by AI, allows the machining performance of the AL40G / AL60G to be demonstrated to the utmost by beginners or experts.

The adoption of a three-sided automated vertical drop machining tank flexibly responds to various needs, from the construction of simple automation by an automated tool changer (ATC) to a full-scale automation

system using a robot. Furthermore, connected core manufacturing can also be realized by the machine control system "S-HARMNY" (Sodick Harmony), and the machine status monitor "S-Viewer" (Sodick Viewer) based on Sodick's unique "Sodick IoT" platform which realizes visualization of core manufacturing.

■ Features of New AL40G / AL60G

1. 3-axis linear motor drive & highly-rigid machine structure

These models are equipped with a high-output linear motor independently developed and manufactured by Sodick, and demonstrates a high-speed and high response machining performance. The non-contact drive without a ball screw suppresses secular change which maintains high accuracy over long periods of time. The XYZ axes equipped with the independently developed linear motor driven by the newly developed SP power supply enables high accuracy spatial positioning, and also improved the servo responsiveness by more than double compared to conventional.

As well as realizing a highly rigid machine structure which was ideally designed using state-of-the-art CAE analysis technology, the adoption of the precision correction function TH COM which minimizes the effect from the temperature change in the installation environment, reduced the amount of thermal displacement by 50% compared to a conventional machine.

2. Linear jump and ceramic slider

The new AG40L / AG60L is equipped with independently developed lightweight and high rigidity ceramic sliders with low thermal displacement for the slide portion of the main spindle linear motor. The synergistic effect with the high speed and dynamic responsiveness linear motor realized high straightness and a smooth drive, which greatly contributes to increased speed and stable machining of deep ribs. The high-speed jump effectively discharges machined chips, and suppresses abnormal arcing and poor machining shapes caused by the secondary discharge which greatly reduces the machining time. A high-speed jump at a maximum of 10 m/min is also possible in the XY axes, which increases the speed of shape machining by horizontal servo.

3. Stable electrical discharge system "Arc-less 4"

"Arc-less 4," Sodick's advanced electrical discharge control technology in which an "arc never occurs," greatly improved the die-sinking performance, including increased speed, suppression of electrode wear to the utmost, and realization of an extensive range of machined surface qualities from satin to mirror surfaces.

High-speed and high precision machining is realized by the integrated high-speed and suitable discharge state detection technology, high-speed discharge pulse control technology, followable high-speed and dynamic responsiveness linear motor servo technology based on the detected machining conditions, and the suitable machining conditions creation technology according to the type of machining to be the base of controlling such functions.

4. Machining performance by newly developed electrical discharge SP power supply

The newly developed SP power supply equipped with an "M4LNK CNC" board realized increased communication speed and throughput speed, which improved the motor control response speed by more than double.

The adoption of new control and new circuits, such as the improved rough machining speed by the short pulse and high peak current ("TMM4" circuit), increased speed in the semi-finishing area by improved biting in narrow gaps ("TPC4" control), improved uniformity of the electrical discharge and increased speed in the finishing area by accurate pulse control ("BSN4" circuit), improves the quality and speed of the overall electrical discharge machining area.

The "Arc-less 4," the evolved type of arc-less and the AI condition adviser LN Pro AI, the evolved type of machining assist function "LN-Pro," increased machining speeds by 20% compared to a conventional machine.

There are other new functions, such as the AI maintenance function "AIM," which demonstrates its potential to the utmost, and the machine control system S-HARMNY and the machine status monitor S-Viewer based on Sodick's unique Sodick-IoT platform, further promote centralized control and visualization of production.

5. Automation system

In recent years, the need for automation systems is increasing for the purpose of increasing the machine operating rate, and improving production efficiency. The new AL40G / AL60G adopted a machine structure which supports various automation systems. These models adopted the three-sided automated vertical drop machining tank and suspended type operation panel, so that various automation system instruments can be mounted easily, which also improves the workability of the operator during setup.

This machine supports various automation needs from a simple automatic tool changer (Shuttle ATC), and large size and medium size automated tool changers which support various types of electrodes (ATC-16/32) to full-scale automation systems which use robots. If it is simple automation, continuous machining while controlling a robot by the "complex machining mode function" and "scheduling function" of the LN Pro AI standardly equipped with the NC unit can be programmed easily. The combination of Sodick's robot system "SRC80" and the dedicated scheduler easily enables on-line setup of automation systems.

6. Eco, energy saving, security and safety

The AL40G / AL60G were developed in consideration of "energy-saving, recycle/reuse, people-friendly, waste reduction and maintenance free" as an eco-friendly machine tool. As well as reducing the number of components by revision of the component parts, Sodick also pays careful attention to the environment for the consumables.

■ Main Specifications of AL40G / AL60G

<Machine Tool>

Each axis travel distance (X-axis x Y-axis x Z-axis)	400 x 300 x 270 [600 x 420 x 370] mm
Table dimensions (W x D)	600 x 400 [750 x 550] mm
Machining tank inner dimensions (W x D)	750 x 620 x 350 [950 x 740 x 450] mm
Maximum workpiece weight	550 [1500] kg
Maximum suspended weight	50 [50] kg
Clamping chuck	EROWA COMBI specification ER-020025
	EROWA ITS specification ER-007521
	3R COMBI specification 3R-460.86-2
	3R MACRO specification 3R-600.86
Distance from electrode mounting surface to upper surface of table (*1)	150 - 420 [200 - 570] mm
Distance from floor to upper surface of table (*2)	830 [850] mm
	760 [780] mm
Machine dimensions (W x D x H) (*2)	1550 x 2440 x 2330 [1740 x 2785 x 2570] mm
	1550 x 2440 x 2260 [1740 x 2785 x 2500] mm
Machine installation dimensions (W x D, maintenance space included)	2400 x 3300 [2600 x 3700] mm
Machine weight (Power supply and service tank included)	4000 [5150] kg
Total electric capacity	10.0 kVA

<Power Supply Unit>

Maximum machining current (*3)	40 A (Option: 80A/120A/160A)
Power supply input specification	200/220V 50/60 Hz
NC unit	Independently developed NC (K-SMC-M4-LINK method)
Number of simultaneously controlled axes	SP: 4 axes max (SP-E: 6-axis Spec. / 8-axis Spec.)

* Value in [ ] is for the AL60G specification.

*1 "Distance from electrode mounting surface to upper surface of table" is for EROWA specification.

*2 If particularly specified, the "distance from floor to upper surface of table" and "machine height" can be lowered. (Thin leveling pads used)

*3 Maximum machining current 120A specification / 160A specification for AL60G only

■ **AL40G External View**

■ Estimated selling price (Tax excluded) and target production quantity

- AL40G (Standard price) from 16 million yen (Tax excluded), 300 units /year
- AL60G (Standard price) from 18.5 million yen (Tax excluded), 200 units /year

■ **Inquiries**

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