

September 30, 2019

Sodick Co., Ltd.

3-12-1 Nakamachidai, Tsuzuki-ku, Yokohama

Kenichi Furukawa, President and Representative Director

Tel: 045-942-3111 (switchboard)

(First Section of the Tokyo Stock Exchange, Code No. 6143)

**New Product Release****Improves Machining Performance of Manufacturing Large Sized Molds for Automobiles****Sodick Releases Linear Motor Drive Large Sized Die-sinker EDM "AG200L"**

In recent years, larger mold structures with more complicated designs are being adopted for large sized molds for bumpers, front grilles, and door panels of automobiles, in response to autonomous driving with various sensing functions, high functionalization, complication and integrated structure of each module including headlamps, etc., and high intelligence conceptual designs. Many complicated shapes, such as small diameter deep holes and slits, etc. which are difficult to machine with cutting tools for stiffening ribs and fixing bosses are arranged in such large sized molds. In order to meet these requirements, there are requests to use die-sinker EDMs to simply perform the machining at high-speed. In response to these requests, Sodick developed and released a high-speed & high performance die-sinker EDM "AG200L" for large sized workpieces which require a maximum travel as a new product of the "AG Series," the best-selling linear motor drive die-sinker EDM.

Based on the C-type column specification die-sinker EDM "AG100L" the travels of the XYZ axes in the AG200L were extended and also, an optimized machine design was adopted with improved mechanical rigidity by the latest structural analysis while reducing the footprint, so that the machine can handle large sized workpieces.

The X-axis travel was extended from 1,200 mm to 2,000 mm, and the Y-axis from 650 mm to 1,200 mm. Sodick successfully realized the downsizing of the machine by reducing the machine dimensions (area) 1.5 times compared to the conventional maximum machine dimensions, while supporting large-size workpieces with about double the maximum workpiece size (area), and a machining tank space volume of about 3.2 times.

Space-savings could be achieved by adopting the world's first \*1 double structure slide method for the Y-axis. The responsiveness of the machining axes could also be improved by reducing the moving weight while extending the travels of the axes, which made stable and high-speed machining possible with the horizontal servos of the XY axes and second cut of the 3 axes. The Y-axis operation is optimally controlled without changing the NC program, by performing an automatic folding operation \*2 during the positioning before the start of machining.

\*1: Sodick's research

\*2: The Y-axis consists of a vertically stacked slide structure where machining axis Y1 and accessory axis Y2 are separated. During machining, servo machining is performed by a lightweight Y1 axis, and the Y2 axis is in the locked state. Although the entire machining range is covered by the full travels of the Y1 axis and Y2 axis, the moving distance of each axis is allocated to an optimal state during the positioning before the start of machining. Since this allocation is executed automatically, the operator does not need to pay attention to the separation operation of the axes, which provides an operation environment as a normal single axis.

## ■ Features of New Product "AG200L"

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

This large sized machine is equipped with a high-output linear motor independently developed and manufactured by Sodick, and demonstrates a high-speed and high response servo machining performance. The non-contact drive without a ball screw suppresses secular change which stably maintains high accuracy and high responsiveness over long periods of time.

The structure was designed with reduced weight of the movable bodies of the XYZ axes, and adopted a highly rigid machine structure, and a bed and table separated type fixed machining tank, which realized suppression of the machine displacement by immobilized workpieces without the axis accuracy being affected by the workpiece weight.

Our unique new Y-axis structure demonstrates a high-speed and stable machining performance, even with the horizontal servos of the XY axes and second cut of the 3 axes. The unique cooling structure of the linear motor suppresses the impact caused by the generation of heat, which enables prolonged automatic operation while maintaining stable accuracy.

### **2. Stable electrical discharge system "Arc-less Plus"**

"Arc-less Plus," 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.

**3. Improvement of linear jump and horizontal servo performance**

The high-speed jump by the linear motor greatly contributes to the increase in the speed of deep hole and deep rib machining, and the stability of the machining. The Z-axis linear high-speed jump effectively discharges machined chips, and suppresses the arc and poor machining shapes caused by the secondary discharge of chips which greatly reduces the machining time. The adoption of a Y-axis double structure sliding method improves the responsiveness of the horizontal servo while extending the travel of the machining axis, which realizes a machining performance equivalent to a medium sized machine. The high-speed jump is also possible in the XY axes, which allows high-speed machining with the horizontal servo.

**4. New NC unit "LN2A2 power supply" and latest man-machine interface**

The discharge power supply unit "LN2A2 power supply" equipped with a high-speed processor designed only for the AG200L realizes a high throughput speed. Various assist functions, including a simple and highly visible operation screen and positioning will support increased operating efficiency.

**5. Improvement in operability and maintainability**

The AG200L adopted a front automatic up/down type door for the machining tank. Securing a 3,000 mm opening in front of the door makes it easy to mount large size workpieces. The adoption of a push button method for the liquid level adjustment, reduction of liquid supply and discharge time to/from the machining tank, and optimization of the filter arrangement greatly improved the check work before and after setup and machining, and the maintainability.

**6. Eco, energy saving, security and safety**

The AG200L was developed in consideration of "energy-saving, recycle/reuse, people-friendly, waste reduction and maintenance free" as an eco-friendly machine tool. Sodick promotes resource savings by reducing the number of components, realized by revision of the component parts, and also pays careful attention to the environment for the consumables used daily.

## ■ AG200L Specifications Outline

### <Machine Tool>

Each axis travel distance (X-axis x Y-axis x Z-axis)	2,000 x 1,200 x 800 mm
Table dimensions (W x D)	2,500 x 1,550 mm
Machining tank inner dimensions (W x D x H)	3,000 x 1,800 x 1,000 mm
Liquid level adjustment range (from upper surface of table)	520 - 950 mm
Maximum workpiece weight	10,000 kg
Maximum suspended weight	100 kg
Distance from electrode mounting surface to upper surface of table	
(Auto clamping) EROWA CONBI specification (ER-020025) /	
EROWA ITS specification (ER-007521)	400-1,200 mm
(Auto clamping) 3R CONBI specification (3R-460.86-2) /	
3R MACRO specification (3R-600.86)	383 - 1,183 mm
(Manual clamping) TP specification (TP-02)	400 - 1,200 mm
Distance from floor to upper surface of table	1,440 mm
Machine dimensions (W x D x H) (Power supply and service tank included)	4,770 x 5,220 x 4,605 mm
Machine installation dimensions (W x D) (Maintenance space included)	5,770 x 6,220 mm
Machine weight (Power supply included)	19,000 kg
Maximum machining tank capacity	6,250 L

### <Power Supply Unit>

Power supply input specification & electric capacity	
(Optional machining fluid cooling unit) included	3-phase AC200V 50/60 Hz 18KVA)
NC Unit	Multitasking OS, K-SMC-LINK method (SI-LINK)
Number of simultaneously controlled axes	Max. 4 axes

## ■ AG200L External View



## ■ Estimated sales price (tax excluded) and target production quantity

- |                                     |                                      |
|-------------------------------------|--------------------------------------|
| - AG200L standard price             | from 63 million yen - (Tax excluded) |
| - AG200L target production quantity | 6 units/year                         |
| - Sales started                     | from October 1, 2019                 |

## ■ Inquiries

Sales Promotion Department  
Sodick Co., Ltd.  
Tel: 045-530-2006