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New finished goods

Ultra-lightweight head, highly rigid gantry structure, and the latest axis guides maximize the high-speed, high-precision, and high-quality drive performance of the linear motor drive system.

Announcement of development and sales of linear motor drive machining center “UX450L”

Sodick Co., Ltd. has developed “UX450L” as a successor to the linear motor drive machining center UH430L.

The ultra-lightweight head, mechanical structure, guide mechanism for each axis, and linear motor have all been newly designed to enable even higher speed and higher precision machining. In addition, “simple program creation function” and “machining recorder function” are installed to improve operability, and newly developed “idling stop function” supports energy saving.

In recent years, smartphones and tablet terminals have been developed to support IoT and big data. Technological innovation is also accelerating toward the realization of autonomous driving systems that apply sensing technology, and the various parts and devices that make up these systems are required to be intelligent, highly functional, and multifunctional. Together with this, there is an urgent need to establish high-speed processing performance for high-precision, high-quality manufacturing in finer and more detailed areas.

Under these circumstances, we have developed a high-precision machining center that can speed up direct cutting of high-hardness materials using diamond tools and improve the efficiency of mirror finishing of optical lenses, based on the fact that improved performance will play an even more important role in replacing manual grinding and other tasks that previously required extensive experience in machining.

UX450L will be exhibited at “JIMTOF2022” (November 8 to 13: Tokyo Big Sight).

■ Appearance of “UX450L”



■ Planned sales price and target production volume

Standard price: 28.5 million yen~ (excluding tax), target production volume: 100 units/year

(*Sales will start in spring 2023.)

■ Main specifications of “UX450L”

● Main unit

Movement distance of each axis (X axis × Y axis × Z axis)	450×350×200 mm
Work surface size (width × depth, jig base)	600×400 mm
XYZ-axis drive	In-house linear motor drive
Max. load weight	100 kg
Main axis rotation speed	1,500~40,000 min ⁻¹ (HSK-E32 type, oil air lubrication) 6,000~40,000 min ⁻¹ (HSK-E25 type, grease lubrication) 1,500~60,000 min ⁻¹ (HSK-E25 type, oil air lubrication)
Tool holder type	HSK-E dual face contact holder
Max. cutting feed rate	36,000 mm/min ⁻¹
ATC (tool changer)	20
Machine tool dimensions (W × D × H)	1,750×3,140×2,180 mm

● NC unit

NC unit	In-house NC unit LN4X
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■ Main features of “UX450L”

- ① Weight reduction of head mass
- ② High precision of guide mechanism for each axis
- ③ New main axis and new thermal displacement compensation function
- ④ High speed ATC
- ⑤ Idling stop function
- ⑥ Machining recorder function
- ⑦ Simple program creation function

■ Detailed explanation

① Weight reduction of head mass

Head mass including X axis has been reduced by 10%. Furthermore, coupled with the optimization of the linear scale arrangement for each axis, the response characteristics of each axis have been improved, making it possible to achieve even higher speed and higher precision machining.

② High precision of guide mechanism for each axis

Equipped with a new linear motion guide with ultra-high rigidity, low waving and damping characteristics comparable to static pressure guides. By minimizing the vibration caused by the entry and exit of the rolling elements, a low waving characteristic comparable to that of hydrostatic guides has been achieved. In particular, it can contribute to improving the quality of machined surfaces in the micro-precision area.

③ New main axis and new thermal displacement compensation function

In achieving high-precision machining, the displacement of the tool tip and the deformation of the machine body due to heat generated during main axis rotation cannot be ignored. Coolant is passed through the structure that covers the spindle body to suppress the deformation of the machine's posture. By temperature and rotation speed information of the main axis, thermal displacement can be estimated and corrected with high accuracy. In addition, a main axis orientation function has been adopted. The change in the phase (angle) between the main axis and the holder when attaching and detaching tools by ATC greatly affects the runout accuracy of the cutting edge. By making it possible to attach and detach in the same phase at all times, variations in runout accuracy are suppressed, making it possible to achieve higher-precision machining.

④ High speed ATC

Improvements to the ATC mechanism have reduced the tool change time by 50% compared to conventional machines.

⑤ Idling stop function

As an energy-saving measure, when the system is determined to be unused, it automatically shuts off the power supply to reduce power consumption. This function can be enabled/disabled.

⑥ Machining recorder function

Just like an automobile drive recorder, it records videos and images during machining and when errors occur. In addition, it can be displayed on the CNC screen and used as information for investigating the cause of machining defects and errors. Recorded video and image data can also be saved to an externally connected USB memory.

⑦ Simple program creation function

Simple drilling, surface machining, and workpiece centering operations can be performed immediately by simply entering the required data in the parameters on the CNC screen.