

Excitron Corporation's New Motorized Rotary Lift Workstation

Ideal for Automated Assembly, Marking, Quality Inspection & More

High precision, ultra-rigid aluminum extrusions from Misumi provides strong, lightweight framework, helped streamline design and manufacturing

Founded in 1993, Excitron Corporation designs and manufactures stepper motors, controllers and accessories to create application-specific motion control devices and systems for factory automation machine builders and system integrators.

Excitron has successfully designed and built motorized products and stepper motor-based sub-assemblies for various government agencies such as NASA, the Environmental Protection Agency and U.S. Department of Defense. Customers also include a host of OEM manufacturers, including Raytheon, Lockheed-Martin, Samsonite, and Rolls-Royce Norway.

Sourcing components a perennial challenge

Excitron's mechanized product line is quite diverse. Among its popular motion control devices are the company's XY, XZ and XYZ robots, rotary tables, and Z-Lifts for inclusion in factory automation machinery and systems. The firm also designs stepper motor-based devices for specialized applications, such as precision laser cutting and forming machines, automated pill sorters, motorized digital camera lens controls and gearboxes/encoders used for taking pictures of the earth.

Excitron builds many of its products around motor sizes that range from miniscule (10mm in diameter and weighing one ounce) to large scale (NEMA 42, 110mm in diameter and weighing 28 lbs), with the broadest selection of size and torque to fit virtually all applications. In most projects, controllers can be integrated with the motor, which offers users a highly desirable combination of compact size *and* rich automation features.

In designing custom machines, company engineers utilize Autodesk Inventor for all metalworking, assembly documentation, product documentation and printed circuit board design. They also provides custom software and firmware to meet customer specifications. All manufacturing is performed at Excitron's Boulder, Colorado plant.

According to Vern Bunch, Excitron CEO and chief engineer, "Because of our product diversity, one of our biggest challenges has always been having fast, reliable access to the precision-made mechanical components we need to produce robust mechanized systems, which are the heart of our business – as well as to create rugged, precision-built equipment frames and housings. It was not unusual for us to spend hours conducting worldwide searches for reliable vendors who could make and deliver the hundreds of parts we needed to fulfill customer orders."

A few years ago, Excitron discovered Misumi, a global supplier of precision-made fixed and configurable mechanical components for factory automation. "Finding Misumi

changed the way we source parts,” says Bunch. “Once we realized we had tens of thousands of Misumi configurable components to choose from – with specifications readily accessible, as well as competitive pricing and quick delivery – our design and production workflow became faster and more productive.”

Case in Point: Designing the Rotary Lift Table

One recent new product design project illustrates how changing its sourcing strategy has helped to create value for Excitron and its design engineering team, as well as its customers.

The product is the recently launched Excitron ZL24-MRT24 Motorized Rotary Table with Z-Lift, which is essentially a rugged, yet lightweight, 24-inch vertical lift combined with a motorized rotary table, and a strong platform for mounting devices. (*See sidebar for detailed product specs.*)

The ZL-24-MRT24 is compact in size, highly versatile, and significantly lighter in weight than similar workstations on the market today. “It weighs in at just under 55 lbs versus the 500 to 1500 lbs weight of typical lift benches and fork lifts,” notes Bunch. “That was by design. Our goal was to create a unique device with broad appeal across multiple markets and applications, so we could market and sell it as a standard item in our product mix.”

The challenge was sourcing components that would allow the design team to ensure the desired performance specifications were met, while still staying within certain parameters for size and weight. Bunch turned to Misumi for consultation. He says he was “impressed by the engineering knowledge displayed by Misumi’s professional staff, as well as their willingness to help find a solution in specifying components to meet our requirements.”

After evaluating various options, Excitron decided to build the entire framework for the table and lift using Misumi’s high-precision, ultra-rigid aluminum extrusions. These structural aluminum extrusions are dimensionally precise (with variability less than .002 in). They are available in standard and custom lengths, various profiles and a choice of finishes. Most important, they offer greater load-bearing strength than standard extrusions, while retaining their rigidity and alignment. Misumi also supplies an extensive range of assembly components and accessories for its extrusions including brackets, fitting nuts and fastening screws.

When Excitron had completed the design and parts specifications for the rotary table and lift unit, about 95 percent of the units total parts were supplied by Misumi. “This saved time and money for us on the engineering end,” notes Bunch. “In addition, with Misumi’s rapid delivery times – typically days rather than weeks or months – we were able to bring the new product to market faster than anticipated. ”

Product lift-off and launch

In the ZL-24-MRT24 Motorized Table with Z-Lift, Excitron has apparently achieved its goal of designing a device with broad market appeal. Since the product launched a few months ago, Bunch has learned that customers are using the lift table as an automated workstation for activities that include laser marking, hot stamping, drilling and machining.

Other manufacturers have reported that they employ the unit for measuring, calibrating and quality control inspections.

This project illustrates why Excitron's engineering team engineers routinely turn to Misumi's massive component catalog in designing standard and custom products, and why they often deploy Misumi aluminum extrusions for creating equipment enclosures, bases and frames. Bunch and his designers have become adept at using Misumi's automated CAD Configurator which allows them to configure components online, eliminating the need for detailed engineering drawings. "The CAD Configurator just makes everyone's job a lot easier," says Bunch.

Bunch estimates that Excitron has saved tens of thousands of dollars in tooling costs over the past several years by specifying Misumi configurable components, and has also been able to shorten design-to-manufacturing cycle times. "Selecting and ordering 90 percent of our mechanical components from a single source rather than multiple vendors saves time and dramatically reduces overall costs. This strategy has helped us increase efficiency and productivity – and has made our products better overall," concludes Bunch. "We could not ask for a better business partner."

Excitron's ZL24-MRT24 Motorized Rotary Table with 24" Z-Lift offers a complete workstation solution for laser marking, assembly, drilling/machining, test, measurement, and quality inspection. Easy to use and extremely versatile, it can be used virtually anywhere in the plant to reduce time and labor by automating repetitive processes. The automated device improves worker safety by keeping operators at a safe distance.

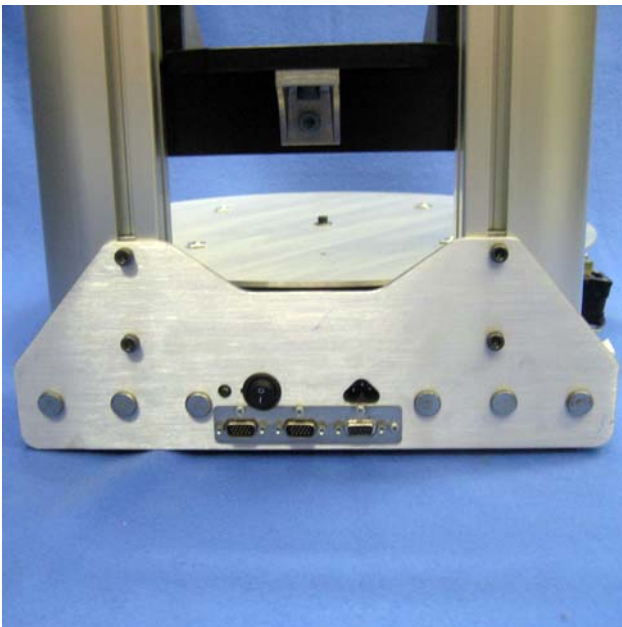
The self-contained ZL24-MRT24 features two built-in stepper motors and two controllers. It has a compact footprint, is strong, rigid and under 60 lbs in weight. All electronics – a built-in power supply, controllers, RS232 cable and data cable – are hidden within the aluminum extrusion base, so there are no awkward cables to contend with.

In action, the leadscrew driven Z-Lift with motorized base can perform extremely precise 24-inch vertical travel (.00025" per motor step), with zero backlash. Maximum lift capability is rated at 25 lbs and easy up/down positioning is achieved via a direction switch and potentiometer for speed change on-the-fly. A rigid platform on the lift can be custom machined for mounting of devices.

The 24-inch diameter rotary table provides full 360° rotation with near-zero backlash and offers CW/CCW positioning via a direction switch and potentiometer for speed change on-the-fly. With high torque of 300 in/lb, it can easily move 50-lb devices. The stepper motor offers high resolution (.03° per motor step) and its intelligent controller can index with time delays automatically, without any additional electronics. A built-in home sensor indicates the table's home position.



The Excitron ZL24-MRT24 Motorized Rotary Table with Z-Lift combines precise 24-inch vertical travel and full 360° table rotation, and can be programmed with extreme accuracy to user-defined positions, directions and speeds to perform various automation functions.



Misumi offers a wide range of Aluminum Extrusions in standard and custom lengths and a wide variety of profiles. OEMs use structural aluminum extrusions, frames and accessories to create equipment enclosures, workstations, machine bases, robotic jigs and fixtures, material handling components, display exhibits, and much more.

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