

# Lenze

OFFERS SIMPLE AND VERSATILE SMART MOTOR

Lenze Americas recently introduced its innovative Smart Motor designed for applications ranging from material handling to packaging automation. Blending the simplicity of a conventional AC motor with electronic drive control technology, Lenze's versatile Smart Motor was showcased at Pack Expo last September.

"In a complex world of motors, Smart Motor keeps it simple," states Robert Gradischnig, electro-mechanical business development manager, Lenze Americas. "The Smart Motor gives packaging customers the power and freedom they want in motion control, with freely adjustable speeds, programmable I/O and integrated functions for conveying needs. Fully programmable from a smart phone, the Smart Motor makes commissioning and diagnosis easier than ever."

Offering a highly versatile and powerful package, the Smart Motor delivers maximum standardization—drastically reducing (by up to 70 percent) the number of different motor variations customers might otherwise need. Equipped with control intelligence in the terminal box, the Smart Motor provides design flexibility for speeds from 500 to 2,600 rpm, while maintaining constant torque. The easy-to-install motor enables mains and starter applications to be handled with greater ease than with conventional motors.

The Smart Motor complies with IES2, the top efficiency class for drive systems, while maintaining a small footprint. Among its standard functions, the Smart Motor enables speed switchovers and the ability to set individual start-stop ramps. Integrated ramps ensure smooth acceleration and deceleration to protect the system mechanics and product being handled. The Smart Motor features full motor protection, eco mode for energy savings, and digital outputs for speed selection, direction and status messages.

"Packaging tasks often need higher starting torque, followed by continuous torque. The Smart Motor has been designed and dimensioned to specifically meet this requirement," adds Gradischnig. "By reducing the total number of different motors required for a given operation, our packaging customers can reduce the costs for engineering, documentation, procurement and spare parts—key aspects in the value-added chain."

**For more information:**

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## TOOLS OF THE TRADE

With its Smart Motor Series, Lenze Americas has created an optimal solution for the conveyor industry, one that has generated some attention at trade shows including Pack Expo, SPS/IPC Drives and Hannover Messe. *Power Transmission Engineering* recently spoke with Eric Klein, director of sales at Lenze Americas, to discuss the other tools and resources available to the PT marketplace in 2014.

Lenze is really focused in three key areas, according to Klein: ease of engineering, mechatronics and safety. "These are the three main themes we focus on with our customers," Klein says. "Most companies don't have the design engineers that they used to have. From a machine builder perspective, we look at their buying process. Our goal is to come up with solutions that reduce energy costs, provide more throughput and reliability."

By lowering the cost of ownership, streamlining the design process and integrating a variety of new technologies, Lenze can provide the tools necessary to optimize products found in industries like automotive, robotics, packaging, material handling and pumps/fans. "We look at the business side of each and every customer and see what exactly they're trying to accomplish," Klein says. Some of the more recent tools available to customers include:

*FAST:* Lenze's standard software modules make it easy to develop modular mechanical control by simply adding the individual modules using the application template. "They might program a drive differently in Spain than they would in the United States," Klein says. "Each engineer would do things a little differently. *FAST* allows a machine builder to pick the applications that matter to them. The engineer can tweak it based on their machine and enhance it from there. What really matters is the engineering time. If they don't have to spend a lot of time re-designing drives, they can focus on what makes a machine better."

*Easy Explorer:* This updated selection tool can be used in the very early planning phase of a drive solution to provide a fast overview of suitable Lenze products. "No extensive product knowledge is needed," Klein says. "You enter some basic data and it will calculate your application's requirements and offer possible solutions."

*Drive Solution Designer (DSD):* Want to see your potential energy savings options? How about an overview of the complete drive structure for all of the machine's requirements? *DSD* makes sophisticated and complex dimensioning expertise available and ensures optimal energy efficiency gains. "You can actually model the energy consumption of each potential solution and make sure you're getting the kinematics and mechatronics right," Klein adds.

While technologies continue to converge in machine design, Lenze offers a variety of innovations and solutions to keep up with the growing trends and help machine builders become more efficient, productive and flexible.

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## Mitsubishi Electric

EXAMINES USER EXPECTATIONS IN MOTION CONTROL AND SERVO TECHNOLOGIES  
BARRY WELLER, MITSUBISHI ELECTRIC

User expectations for motion control and servo technologies are changing, with more emphasis being placed on ease of installation, energy efficiency, safety and productivity. **Barry Weller** of Mitsubishi Electric looks at the current trends and the future of these vital technologies.

High-precision servomotors, intelligent servo amplifiers and high speed motion controllers have been available for many years, and have developed steadily over that time. There are many established uses for servos and motion control, and probably just as many potential new users that are yet to adopt the technology.

Today's emerging trends and new developments provide a guide to how servos are likely to advance in the coming years. Mitsubishi Electric's new MR-J4 servos, launched this month, embody many new features that are expected to become the norm over time.

One aspect that the market is always keen on is improving ease of use or "user-friendliness." Commonly one of the most time consuming parts of any servo system is tuning the servomotor to the machine it is installed in. The result of not tuning the servo properly is an underperforming machine or irregular production. Usually the person tuning the system needs a high level of both training and experience. By giving the servo amplifier the intelligence to

do this tuning, the commissioning time is reduced. The MR-J4 Servo amplifier achieves this with its "One Touch Tuning Function;"

using this function the engineer simply chooses from three different types of machine criteria and lets the servo amplifier do the rest. The servo amplifier then tunes to the machine and any machine resonance points are detected and automatically filtered out. Even machine vibration can be suppressed. Of course some of these resonance points may change over time due to machine wear. To overcome this, the fillers can be set to continually adjust over the life of the machine.

The latest amplifiers also have a "Machine Diagnosis Function" that monitors not just the actual condition of internal components such as capacitors and relays, but also external components like the bearings, belts or ball screws. The system then notifies the user regarding any degradation in operation. This makes both unplanned downtime and machine outage time a thing of the past and can therefore make a significant contribution to long-term productivity. If an alarm does occur, the internal drive recorder



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gives the maintenance engineer full diagnostic information before and after the alarm occurrence. This makes the cause of the alarm easy and quick to identify, reducing any downtime.

## Safe Operation

Functional safety requirements are continuing to evolve and become more demanding. Mitsubishi's MR-J4 amplifiers have an integrated two-channel STO (Safe Torque Off) input. This can be augmented by an additional option module to provide SS1 (Safe Stop) input in line with EN61800-5-2. The system configuration then also supports SIL2 (EN62061) and PLd (EN13849-1). Embedding the safety on the amplifiers gives greater flexibility in its use and also reduces machine start-up times after the cause of the safety stop-page has been resolved.

Servomotors have always been at the forefront of accuracy. This accuracy helps manufacturers reduce the amount of raw materials used in production and increase the product quality, so there is a constant drive to improve this accuracy. The MR-J4 amplifiers, for example, are being fitted with 22-bit absolute encoders as standard, providing a resolution that corresponds to more than --four million pulses per revolution. This resolution not only increases accuracy but also gives a smoother motor rotation, often known as reduced cogging.

## Environment

Environmental issues are on the top of everyone's priority list and often we are looking at how technology can help reduce our carbon footprint. This could be looked at in many ways, from energy saving to the amounts of raw material used. For these reasons Mitsubishi Electric has developed dedicated two- and three-axis amplifiers that provide cost, space and energy savings, compared to using a set of single-axis amplifiers. These amplifiers also offer significant reductions in wiring and commissioning times.

The design of the servomotor itself is also being refined. One of the key ingredients in the motor construction is rare-earth magnets. The MR-J4 range of motors use 30 percent less metal than the previous generation, while still increasing performance.

The MR-J4 motors range is available in 200 V and 400 V and includes power ratings from 100 W to 22 kW. The MR-J4 servomotors are designed for compliance with either IP65 (dustproof), IP67 (wash-down) or to food and beverage hygiene standards.

Therefore, we can summarize that servos and motion control technologies have developed a long way over the last 20 years and are likely to continue developing for many years to come. Similarly, the market is evolving and growing as new application areas are opening up. There are many drivers for this, including steadily falling servo costs and rising performance levels, new fields being automated (e.g. medical procedures), servos replacing other technologies such as hydraulics or steppers, increasing awareness by user groups, and developing geographic regions.

The emerging generation of servo technology represents a significant advance on current standards, and we can be sure that new developments will continue to emerge for many years yet.

## For more information:

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# Emerson

OFFERS MORSE RAIDER PLUS SPEED REDUCERS

Emerson Industrial Automation's Morse Raider Plus speed reducers utilize advanced finishing techniques, additional bearings and special seals to arm them for leak-free performance, guaranteed for 18 months. Suitable for conveyors, mixers and bucket elevators in the food, beverage and grain industries, the Raider Plus computerized gear centering optimizes the gear mesh for reduced heat and debris formation, eliminating unnecessary backlash and delivering high efficiency and long life.

A patented roll-burnished journal finish extends seal life up to four-fold, and exclusive double-lip seals on both input and output shafts provide leak-proof operation in highly contaminated applications. The Raider Plus also features an exclusive non-metallic quill liner that reduces fretting and corrosion, and eases motor removal. Large, single-row ball bearings absorb radial and thrust loads on higher input speeds, while heavy-duty tapered roller bearings on all output shafts handle inherent gear load and provide maximum overhung load capacity.

"A key design component of this reducer is a second input bearing that reduces wear and fatigue on the input seal," said DeWayne Polley, gearing product specialist for Emerson. "The second input bearing minimizes shaft movement during motor installation and operation. We tracked the performance of the Raider Plus and are confident the materials and assembly of this product support an 18-month, leak-free guarantee."

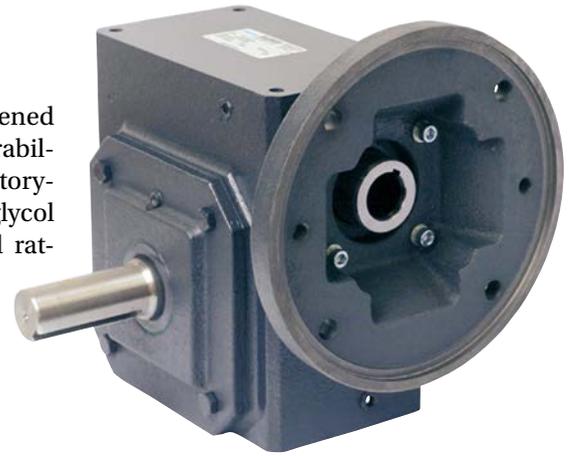
Four unit models - the "U", a universal style with an output shaft; the "Q", a c-face-style with an output shaft; and both styles with hollow outputs - are available from stock with a center distance range of 1.0" to 6.0", ratios from 4:1 to 3600:1, and output torques from 82 to 22,416 ft-lbs.

All Raider Plus housings, motor adaptors, covers and mounting bases have cast iron single-piece construction for maximum strength and dependability. Forged bronze worm gears, precision manufactured to AGMA specifications, provide greater tensile strength than cast bronze. The

integral worm and shaft are hardened to 58 RC for extra strength and durability. The speed reducers are all factory-filled with FDA-approved polyglycol synthetic lubricant for enhanced rating and reduced thermal rise.

### For more information:

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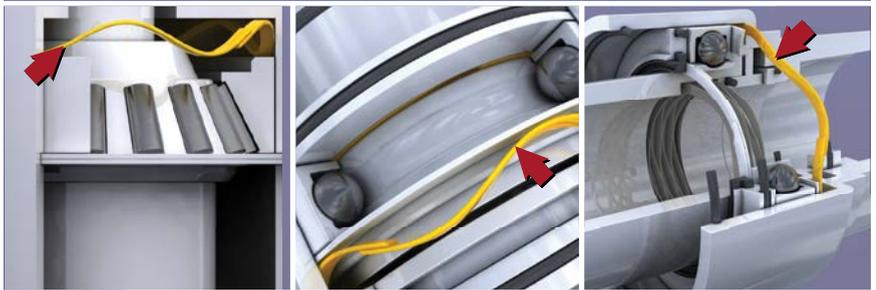


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# Siemens

RELEASES MOTOR/DRIVE PACKAGE

Siemens Industry, Inc. announces the release of combination motor/drive packages, allowing an OEM or end-user the option to select the optimum solution for a variety of heavy-duty industrial motion control applications from a single source, backed by a full three-year warranty. Choosing from a pre-determined list of motor/drive combinations, the customer simply makes the selection best suited to the application. The motor and drive are packaged on a single pallet, shipped and invoiced together.

The motor and drive combinations are power-matched for 480 V high-overload operation through a 20 hp range, with I<sup>2</sup>T protection from thermal damage provided as a standard in both the motor and the drive components. The Siemens Intelligent Operator Panel (IOP) is included with these packages, allowing easy step-by-step drive start-up.

Application macros are provided in the Sinamics G120C drive for easy installation and wiring; the terminals are pre-assigned at the factory and the parameters are automatically set. The Simotics SD100 motors are rugged cast-iron with inverter duty ratings

in a 4:1 speed range for constant torque and 20:1 speed range for variable torque. Simotics SD100 units are severe-duty TEFC motors that meet NEMA Premium efficiency.

Communications selections on these matched motor/drive combinations include RS485 with USS and Modbus protocols. A Profibus variant is also offered for a Totally Integrated Automation (TIA) solution. TIA is the proprietary Siemens solution for achieving optimum performance, energy efficiency and sustainability within a machine or manufacturing environment. Standard pricing has been established for a wide variety of motor/drive combinations from 1–20 hp, and is included in the available literature on this new Siemens service.

**For more information:**

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Phone: (847) 952-4158  
[www.usa.siemens.com/drives](http://www.usa.siemens.com/drives)



# Revolvo

PROVIDES PUMP SOLUTION AT WASTE WATER PLANT

Revolvo SRB split roller bearings are providing heavy duty support for the crankshaft of a large sludge pump at a United Utilities waste water treatment plant in Oldham, U.K., follow-



ing operational problems with the pump that resulted in damage to its original bearings and crankshaft. Revolvo was introduced to the project by ERIKS Electro Mechanical Services, who were commissioned to refurbish and repair the sludge pump, including straightening the crankshaft, bearing replacement, drive re-alignment and on-site assembly and commissioning. The total value of the contract was in excess of £200,000.

A total of seven heavy-duty 150 mm SRB split roller bearings and housings were supplied for the application to the ERIKS EMS site who undertook the reassembly and installation of the crankshaft assembly. This was achieved within time and on budget, and the pump is now back in continuous service at the Oldham site.

**For more information:**

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# Luneta

## LAUNCHES CONDITION MONITORING POD

Luneta announces the launch of the Condition Monitoring Pod (CMP), a new multi-parameter inspection device modernizing and expanding daily lubricant inspections. This offering is part of a larger plan to roll out a series of innovative inspection-related products in the next few years. The CMP is a visible inspection window revealing critical health conditions of the lubricant and machine. Its proprietary design serves an unmet industry need, providing an improved method of inspecting the health of machinery without the need for laboratory analysis.

The CMP boasts a robust platform of 16 capabilities (10 of which are uniquely exclusive to this innovative tool). Other features include: built-in oil sampling port, easy-to-remove-and-view magnetic plug, corrosion/varnish inspection probe and a quick lubricant access point for syringe sampling.

Best applications include gearboxes, bearing oil sumps, hydraulic reservoirs, compressor oil reservoirs, turbine-generator main oil tanks and paper machine central reservoirs. "We believe that Luneta has re-invented the sight glass by turning it into the focal point of machine condition monitoring," said Luneta CEO Tom Fitch. "The Condition Monitoring Pod makes oil analysis as simple as performing daily machine inspections. A sight glass should not be limited to simple oil level inspections. Instead, with the CMP, an array of critical machine and lubricant conditions can be examined in just seconds. And, it signals the beginning of Luneta's vision to enhance



machine reliability through the development of groundbreaking inspection technologies."

### For more information:

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