

Less is More: Applied Motion Products

SUPPLIES TWO AUTOMATION
SOLUTIONS, ONE UNIT

Why buy a stepper drive and motor separate when you can get both in one product? In response to a mounting industry trend to consolidate component parts, conserve space, reduce wiring and minimize costs, Applied Motion Products introduces the STM drive+motor solution, providing a stepper drive and motor two-for.

“Traditionally the motor is housed within the machine while the drive module and controller, if used, are housed in an external control cabinet, requiring that a motor cable run from the control cabinet to the motor,” says Richard Hazelwood, engineering services manager for Applied Motion

Products. “Because the STM is a combined drive and motor unit, the only additional requirement for operation is that power be supplied, which is likely already distributed around the machine to other devices.

“Many people like the idea of a single unit instead of two; it saves space and wiring and tends to be more cost effective,” Hazelwood says.

The first product developed in collaboration with Shanghai partner AMA, the STM drive+motor features advanced current control, electronic damping (anti-resonance) technology, command signal smoothing and torque ripple smoothing. The STM is suited for a range of automation applications, including medical, packaging and semiconductor. The RoHS-compliant and CE-certified standard units are protected against over- and under-voltage, over-temp, motor shorts and motor open phase.

The STM comes in a 92.4 mm length version with output torque

up to 125 oz-inch, or a 114.4 mm length version is available offering output torque up to 245 oz-inch. The drive+motor unit supplies three digital inputs, a digital output and an analog output, and users can choose between two communication interfaces. Stall detection and prevention functions are provided by an optional 1,000-line encoder that is part of the motor body, leaving the unit's size unaffected.

In addition to these features, two versions, S and Q, with varying control options, tailor the product towards more specific uses.

“The STM-S version is for those who have an existing step motor controller; it accepts an industry standard pulse and direction signal,” Hazelwood says. “The S version also has an oscillator function. This means it can be set to run at a specific speed without an external control. Lastly, it can be controlled by a host PC sending it commands over the serial port.”

The STM-Q version provides stand-alone programmability along with real-time host or HMI compatibility. This is achieved through the command set that includes motion, I/O, math functions and program control. “Q is our motion control language. With Q, a drive can be programmed to perform a sequence of moves or operations based on calculation or external signals from other systems,” Hazelwood says. “We have systems in place with ‘complex motion profiles.’ This is where the motor will change speed during a given move distance and systems that communicate to host devices while executing a move sequence.”

The STM drive+motor uses several methods to avoid disruptive vibration. The motor functions more smoothly while wear is minimized on the mechanical components due to command signal smoothing, which converts full- or half-step signals into microstep waveform and does away with jerky transitions that emerge from the command signal's velocity profile, according to Hazelwood. Motion is



also leveled out using torque-ripple-smoothing technology, which results in low speed torque ripple by modifying waveform. A microstep emulation technique allows motion to occur with less turbulence as the step motor moves less than a full step at a time.

“Some older systems do not have the benefit of being able to supply pulses at the higher frequency required for microstepping, and hence can only control older ‘full step drives,’ losing the function of smoother motion. We give that function back to those using older systems,” Hazelwood explains.

The STM provides advanced current control, which is achieved when a complex current loop uses high-speed, 12-bit current and voltage sampling, real-time math motor modeling and high resolution PWM amplifier control, Hazelwood explains. The motor’s parameters are measured and configured by self-test and auto setup features. Electronic damping, or anti-resonance technology, allows for ample use of available torque and eradicates midrange instability for higher motor speeds.

“In the world of step motors, users would purchase a motor with up to twice the necessary torque so that the system resonance found at the mid-range speeds would not cause the motor to ‘stall’ or fail in the movement it was to perform,” Hazelwood says. “Electronic damping prevents this resonance from affecting the system, so the large torque overhead is not needed, thus saving money, or just providing better performance from the existing choice of motor.”

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H1 Pumps

DESIGNED FOR MOBILE MACHINING

Sauer-Danfoss released the H1 115/130 cc pump as an addition to the H1 family of closed-circuit variable displacement axial piston pumps, which includes the 45/53 cc single pump and the 78 cc single pump.

The H1 pumps are compact and have a high power density for simple installation and more design flexibility. The units have an integral electro-hydraulic servo piston assembly to control the rate and direction of hydraulic flow, according to the company’s press release.

“This new generation of H1 pumps will be a popular size for many hydrostatic applications,” says Randy Rodgers, Sauer-Danfoss product portfolio manager. “The H1 family of pumps offers the OEM a number of advantages including an increased selection of displacement and product design life, and opportunities to improve vehicle maintenance and operating costs.

“The H1 pumps are built to support next-generation engines as the industry moves toward Tier 4 emission controls,”

Rogers says. “They are fully PLUS+1 Compliant to interface seamlessly with Sauer-Danfoss’ electronic machine control architecture. H1 pumps offer the right displacement, right load life and the right value for the OEM’s machine investment.”

The H1 family is for high- and medium-power mobile machinery that requires steady, instant propulsion and exact control. The pumps are designed for complex applications demanding high productivity for off-highway industries including agriculture, construction, road building, material handling, forestry and turf care. Rogers says, “H1 pumps are designed for smaller package sizes with a significant reduction in the length of the units, giving design engineers more freedom and flexibility in design.”

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Bosch Rexroth

EXPANDS EXTERNAL GEAR PUMP LINE

Adding two nominal sizes to the SILENCE pump series and optimizing two standard series models, Bosch Rexroth users can choose from over 5,000 pump variants and 500 motor options available in the modular line of external gear units.

The B and G Series pumps have been modified to offer more power. The displacement of the B Series has doubled to seven cubic centimeters per revolution. The G Series now offers displacements up to 63 cubic centimeters per revolution to serve applications in the upper power classes. Versions with cast-iron bodies are now available for special requirements, such as high numbers of load cycles and long service life.

The U and T series have been added to the SILENCE pump family. They feature low noise emissions and vibrations, and they satisfy demands for all displacements between four and 63 cubic centimeters per revolution.

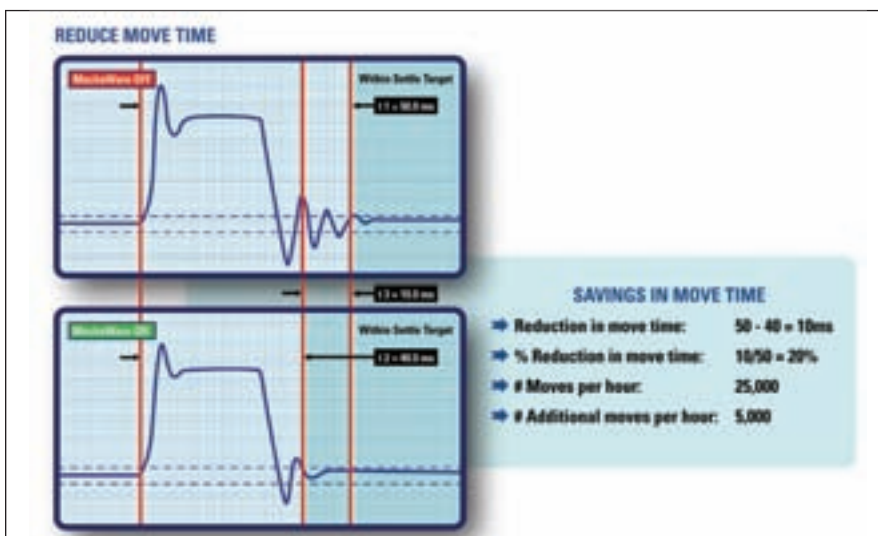
Rexroth's individual or combined multiple external gear pumps are



designed for machines and systems with maximum operating pressure of 4,000 psi and cover a speed range up to 6,000 rpm. Low starting pressure exemplifies the external gear motors, and they offer a high power density and high efficiency with economical life cycle costs, according to the company's press release.

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Mechatronic Toolkit

INTEGRATES MECHANICAL,
CONTROL SOFTWARE DESIGN

MechaWare 3.0 from Danaher Motion is a special-purpose toolkit for motion system design that allows software and mechanical engineers to work together in designing, testing and modifying custom motion algorithms in less time and cost.

Features include complete capture, logging and visualization tools that

enable mechanical, I/O and software data to be combined into a single measurement environment. “What previously took months of development time and often had to be outsourced to specialist consultants, at a cost of tens of thousands of dollars, can now be achieved internally, often in just hours,” says Dr. Robert Steele, Chief Technical Officer of Danaher Motion Performance Controls Group.

MechaWare 3.0 has a library of standard function blocks that supply specific information about control theory. The software can merge with

third-party tools like *MatLab* and *Simulink* and achieves uninterrupted download of run-time code as well as test and measurement of real-time machine performance. As a result of the libraries, designers can use emerging accelerometer feedback devices, so they can create mechanisms with less weight and stiffness for lighter, faster, smaller and more precise machines.

“With *MechaWare*, mechanical and software engineers now have the ability to merge their expertise seamlessly to produce superior machines quickly and much less expensively,” says Bill

West, director of performance controls engineering at Danaher Motion. “Users can now iterate their designs faster, while taking advantage of other advanced tools and technologies—all of which leads to more innovative and successful machine designs.”

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Servo Drive Family

ADDS MULTI-AXIS CAPABLE MODEL

Parker Electromechanical Automation Division introduces the Compax3M industrial servo drives for multi-axis applications. The Compax 3M uses one power supply to power multiple drives and saves cabinet space as all axes are inserted and share a braking resistor.

There are three options for continuous current output: 5, 10 and 15A, all with a 2-inch axis width. A 30A power level with a 4-inch axis width is scheduled for release in the fall. A centralized power supply allows different AC mains voltages to be used on the whole drive combination without adaptive measures. Other features include a single braking resistor and mains filter. The Compax3M can be configured to be a simple drive controlled by a motion controller or a fully intelligent drive programmed in all international standard languages.

For more information:

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Microstepping Driver, Controller

COMBINES INTELLIGENCE AND PERFORMANCE

The R356 microstepping driver and controller from Lin Engineering can output up to three amps of peak current, can handle between +1 to 40 DC volts of input and is capable of microstepping resolutions from 2x to 256x. The microstepping range allows for up to 51,200 miniature steps for each complete revolution on a bipolar 1.8 degree step motor.

Other features include programmable ramps and speeds, software selectable hold and move currents, four user configurable digital I/Os, an optical

sensor for homing and a switch closure to ground. The R356 uses RS485 communication, allowing users to make commands from a Windows based program or from Lin Engineering's graphical user interface, *Lin Control*.

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Megalife Power and Free Conveyor Chains

REQUIRE NO MAINTENANCE



The Megalife range of power and free conveyor chains by Iwis uses a patented link with sintered metal bushes and running rollers to provide maintenance-free operation. The chain links and running rollers are supplied with a lubricant while running by a built-in

lubricant reservoir. The sintered bushes are soaked in oil in vacuum conditions while the chain surfaces remain free of lubricant.

These chains apply to packaging and food processing, the electronics industry, PCB production, conveyor systems, wood, glass and ceramics processing and medical engineering. They are recommended for applications in which lubrication is either impossible or not beneficial, including dry ambient conditions, cleanrooms, installations with restricted maintenance access and applications where contamination needs to be prevented, according to the company's press release.

The Megalife chains are low wearing, even in extreme conditions, and the required drive power and chain load

are reduced by the sintered metal rollers, which cut friction up to 30 percent. Iwis offers the chains in plastic and hardened steel versions. The steel roller option can be used in a temperature range from -40 degrees Celsius to 160 degrees Celsius, and the plastic rollers can handle up to 80 degrees Celsius. The Megalife conveyor chains are offered with pitches of 12.70 mm and 19.05 mm.

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Linear Magnetic Sensors

DESIGNED FOR
INDUSTRIAL APPLICATIONS

Infineon Technologies introduces the TLE4997 and TLE4998 programmable linear magnetic sensors used in angle, position and current measurement devices for industrial applications. Both have programmable parameters that include offset, bandwidth, polarity, output clamping, magnet thermal compensation coefficients and memory lock. The TLE4997 sensor provides analog output while the TLE4998 provides SENT or PWM output interfaces.

“Infineon is building on its position as a leading provider of linear hall sensors for the automotive industry with new products that will expand the company’s reach to industrial applications such as position, rotation and electrical current measurement,” says Bruce Strachan, sensor marketing manager for Infineon Technologies North America Corp.

Both new sensors are surface mount devices operating at three optional ranges: ± 50 , 100 and 200 m Tesla. The TLE4997 and TLE4998 feature 12-

bit resolution and offer low ratiometric error in the range of -40°C to 150°C .

For more information:

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Hose Guard Products

SURVIVE RUGGED CONDITIONS

A new line of hose protection products from Kurt Hydraulics includes four styles that are designed to prevent premature failure resulting from wear, abrasion and deep cuts in rugged applications. They are available as a complete hydraulic hose, coupling and protection system and are offered in a range of diameters and lengths.

The Spring Wire Guard style slides over a hydraulic hose and protects the hose surface. The corrosion resistant coiled steel wire covering is heavy duty and prevents hose kinking while distributing bending pressure over the length of the hose.

The Spiral Steel Wrap, made from galvanized steel, is the highest level of hose protection in the most severe operating conditions. Depending on an application's tightness, the material covers 80 to 100 percent of a hose's surface.

The Nylon Sleeve Guard provides complete hose coverage. The woven Nylon hose protection product flexes



freely, is capable of withstanding thousands of abrasion cycles and slides over the hose quickly for prompt, simple installation.

Shutting down for installation is unnecessary with the Spiral Poly Wrap because it can be installed over existing, positioned hoses and cables. It is made of sturdy-yet-flexible black elastomer with protective beveled edges. It is capable of consolidating several loose

hoses and cables into one line and can enter or exit at any point.

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Shaft Adapters

ELIMINATE NEED FOR SPECIAL SHAFTING

Sterling Instrument's 21-inch and 27-metric-size stainless steel adaptors, referred to as the S52FCY (-, M) Series, offer precision, tight bore tolerances as well as shank and bore/shank concentricity. The adapter's female end is designed to fit 14 shaft diameters from 0.1200" to .4998" (3 mm to 12 mm) and features the Fairloc integral

fastening system. The male side of the adapter features shafts in diameter from 0.1247" to 0.4997" (3 mm to 12 mm).

The Fairloc patented integral hub fastener does away with marred shafts, permits frequent phase adjustment, timing and position adjustment, and Fairloc adds positive metal-to-metal fastening strength along each hub section.

The integral hub fastener has two slots machined into the hub, radially and angularly. This produces a transverse wedge attached to the solid portion of the hub on one side. A cantilevered clamping section results, which has a tapped hole to accept a cap screw passing through a clearance hole in the solid part of the hub. The cap screw passes into a threaded hole in the transverse wedge section. Once the screw tightens, the cantilevered section clamps the shaft. The screw tightens and releases without damaging the shaft or altering the torque-transmitting abilities.

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Larger INTEGRAmotor Twice as Powerful

The latest addition to Bodine Electric Company's INTEGRAmotor product line is the 34B/FV, a 24-volt brushless DC motor with a 34B frame. It combines a PWM speed control, brushless DC motor and optical encoder. The 34B/FV is twice as powerful as any

Bodine model, providing 187 watts and up to 100 oz.-in. continuous torque.

The larger framed model features a regulated 24 VDC power supply, and an integrated control receives inputs from an external motion controller or programmable logic controller (PLC).

The external controller accepts closed-loop feedback provided from an enclosed 1024 PPR and an optical encoder. The 34B/FV can be combined with several types of gearheads—parallel shaft, right angle or hollow shaft—and output speeds run between 0.3–500 rpm with

continued

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rated torque up to 350 lb-in.

Designed as a more affordable alternative for applications in need of stepper or high-end servo systems, the 34B/FV is capable of replacing brush-type DC motors that operate continuously or in applications where contamination from carbon dust must

be avoided. The INTEGRAmotors are used in medical equipment, packaging machines, conveyor systems, printing and photo finishing machinery as well as factory automation applications. They are available with food-grade gearhead lubricants.

For more information:

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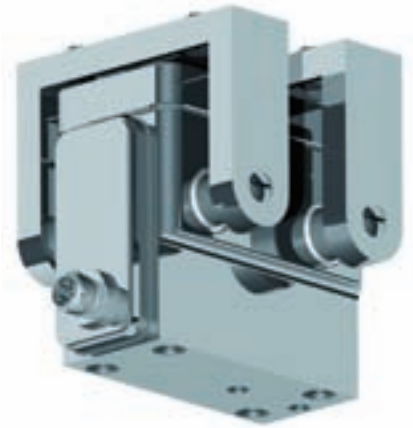
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FOOD-HANDLING



Techno-Sommer Automatic's GGL-3060 food gripper is manufactured according to IP69K standard, so it resists high-pressure and high-temperature—

washdown—cleanings. The stainless steel design resists corrosion and is a compact size. The gripper also complies with DIN 1672-2 guidelines for hygienic food production machinery, meaning it is safe around food.

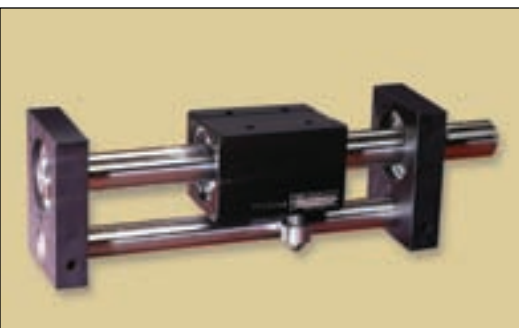
The gripper's jaws open to a full 180 degrees, which allows it to clear material below it. An angular design allows for up to 33 Nm (24 lb/ft) of gripping torque, and sensors are used to sense jaw position.

For more information:

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Linear Indexing Drive

RESISTS CLOGGING,
JAMMING



The RS indexing drive from Amacoil/Uhing provides a backlash-free alternative for linear motion systems. It comes in seven sizes to accommodate axial thrust requirements from 22 to 450 pounds. The rolling ring bearings' inner race remains in point-contact with the shaft, and between the shaft and bearings, there is no free movement.

The result is that the rotary motion input converts into linear output when the shaft rotates and during reversal.

The model RS has built-in overload protection because the drive runs on a smooth shaft, eliminating threads where debris could build up and jam. A safety feature exists in the event of an overload, so the nut slips but won't jam. The system components are protected from damaging churning and grinding accidents. The RS drive has consistent throughput rates from reduced downtime when cleaning threads and repairing.

The RS linear drives are manufactured in five linear pitch settings. They are applicable in many automated production processes including packaging, converting, textile, automotive, metrology and CNC machining. The only maintenance the drives require is modest shaft lubrication once a month.

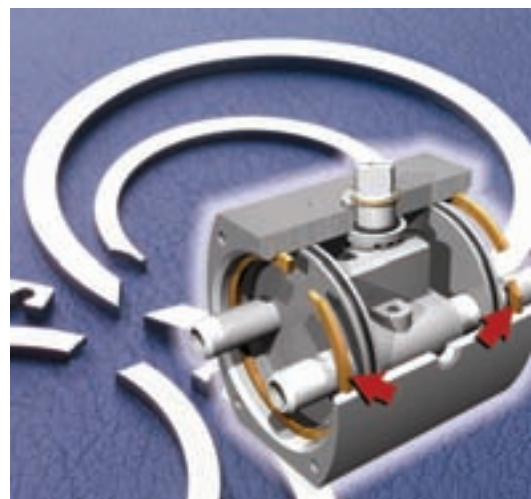
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Four Snap Rings' Series

RANGE
THROUGH
300 SIZES

Smalley Steel Ring introduces four new series of Snap Rings, which can be interchanged with Eaton rings. The XAH, XAS, XDH and XDS series come in over 300 sizes from .375" to 10" or 13 mm to 300 mm.



The Snap Rings are made by edgewinding, and the company can make them from .200" to 90" without any tooling charges. Four other standard series are available in inch and metric units. Smalley Snap Rings are used in automotive and heavy equipment industries for heavy duty and impact loading applications, according to the company's press release.

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