

It's Time to Roll Out the ER

Automation Actuator Division Introduces a New Rodless Linear Actuator

After three successful years with the ET Series Electro-Thrust Cylinder, the Automation Actuator Division is pleased to unveil the newest member of Parker Automation's team, the ER Series Rodless Actuator.

Why a Rodless Actuator?

A *rod-type* thrust actuator, such as the ET Series, produces thrust in one direction and is not intended to provide any load support apart from thrust and a limited amount of side load. Typically a load being transported via a rod-type actuator rides on its own bearing support.

The *rodless* design provides that bearing support along with the thrust required to transport the load. In addition, all of the stroke is contained within the confines of the actuator body, whereas a rod-type actuator, when fully extended, can measure nearly

twice the length of the actuator body.

Some applications favor one design over another. Parker's ER and ET Series feature both design styles, providing the customer with the entire solution, no matter what the application requirements.



Building on a Proven Design

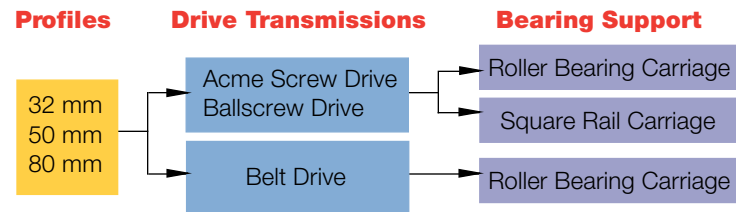
The ET Series has proven to be a rugged and reliable performer. Its robust design features anti-rotate roller bearing wheels, angular contact bearings, hard-coat anodized construction and unequalled rod bearing support. The ER Series inherits this same ruggedness. Its equally solid design offers the same hard-coat anodized aluminum body, Nylatron roller bearing wheels and angular contact bearings for screw support, along with a very unique unitized heavy-duty carriage.

The modular nature of the ER Series' design allows for easy connectivity with structural framing, such as ParFrame aluminum for building multi-axis motion systems. The ER Series is easily integrated with Parker Hauser gantry systems for vertical axis motion.

Parker: Committed to Maintaining the Shortest Lead Times in the Industry

As with the ET Series, most ER Series will be able to ship in two weeks. These lead times are the best in the industry, and Parker intends to continue to meet your delivery needs.

Match the ER Series to What the Application Demands



Three Profile Sizes: 32, 50, 80 mm

The ER Series is available in three profile sizes to accommodate a broad range of loading scenarios. The hard-coat anodized profile body is extruded with T-slots for the mounting of accessories, such as end-of-travel and home limit switches. Available with six different ISO mounting styles, the rodless profiles are protected by a stainless steel strip seal covering the internal mechanism.

Standard Roller Bearing Carriage Offers Long Life in a Simple, Low-Cost Design

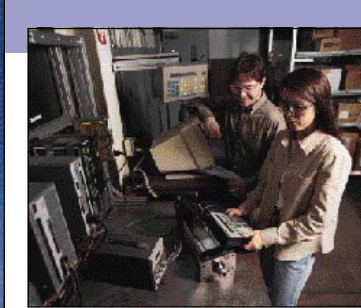
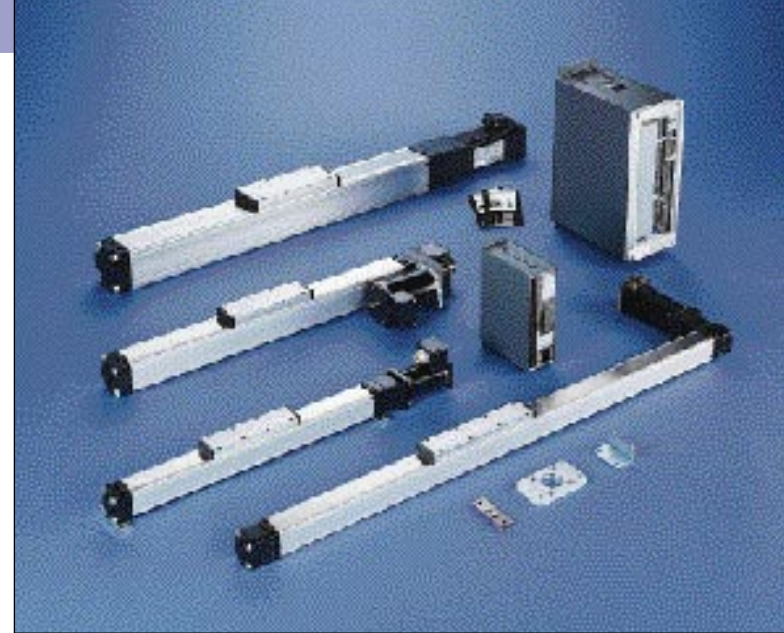
The ER Series was designed to be the right tool for the right job. For light to medium duty applications, the ER comes standard with a pre-loaded roller bearing carriage, incorporating Nylatron-covered roller bearing wheels with our unitized heavy-duty carriage. The roller design combines low friction and low cost in a carriage built with long life in mind (approximately 100,000,000 inches). The carriage comes complete with a standard load mounting plate. Its design makes it easy to incorporate a custom mounting plate tailored to meet your specific requirements.

Optional Square Rail Carriage Handles the Heaviest Loads

For heavier duty loading situations, the ER Series may be ordered with an optional square rail bearing carriage. This square rail design increases the normal, side and moment loading capabilities of the actuator. The carriage rests on two saddles riding along a precision linear guide rail mounted to the actuator body. In addition to greater loading capacity, the square rails' increased stiffness reduces carriage play, extending actuator life. Currently, the square rail carriage is available only with a screw drive.

Screw Drive Systems Combine High Thrust and High Repeatability

For applications that require higher thrusts or high repeatability, the ER Series is available with either an acme screw or a ball screw drive system. Acme screw drives are self-locking and difficult to backdrive, making them particularly well suited to vertically-oriented applications. Acme screw models work well in lower speed and lower duty cycle applications, and are capable of providing high thrust and high repeatability.



Combine an ER Series linear actuator with a stepper or servo system from Parker Hannifin to form a complete programmable linear positioning package.

ISO Mounting Options Make Integration Fast and Convenient

The ER Series offers six different ISO mounting styles that accommodate mounting from the bottom, the side and the end of the actuator. Convenient T-slots included in the extrusion profile allow the user to choose a very wide variety of mounting methods.

The Complete Parker Package

Combine an ER Series linear actuator with a stepper or servo system from Parker Hannifin to form a complete programmable linear positioning package. The ER Series is ready to mount to all stepper and servo motors currently offered by Parker Hannifin, including Compumotor, Digiplan and Hauser. Like the ET Series, the ER Series may be ordered with a motor mounted, tested, and ready to install.

Ballscrews are low friction systems combining a recirculating ball bearing nut and a quality rolled screw. Low friction allows high duty cycles as well as high speeds. When the application requires high thrust, high repeatability and high duty cycles, the ballscrew-driven ER Series is the optimal selection.

High Speed Belt Drive Systems Increase Throughput

For high speeds, the user may opt for a polyurethane steel-reinforced belt drive design. The belt drive can be directly driven or driven through a reduction system, providing high speeds and high accelerations. When throughput is an issue, the ER Series belt-drive is the ideal low cost, high speed positioning system.

Inline or Parallel Motor Mountings Fit Your Design Needs

Depending on the design envelope of the application, it may not be possible to fit a linear actuator with an inline motor adding length to the package. Alternatively, a timing belt arrangement may be needed to increase speed or decrease the torque and inertia seen by the motor. For such instances, the ER Series offers 22 different motor mounting variations, offering both inline and parallel arrangements for both the screw drive and belt drive versions.

ER Series by the Numbers

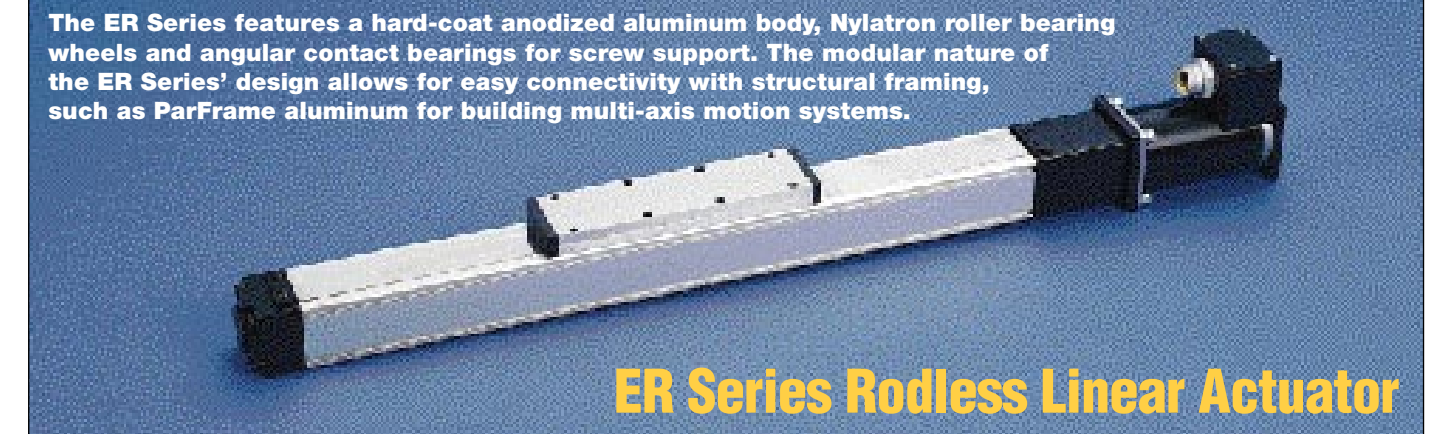
Roller Bearing Carriages

	Belt Drive	Screw Drive
Maximum Speed	200 in/sec	75 in/sec
Maximum Thrust	160 lb	1600 lb
Maximum Normal Load	119 lb	119 lb
Unidirectional Repeatability	+/- 0.004 in	+/- 0.0005 in
System Accuracy	0.02-0.08 in	0.02-0.04 in

Note: Thrust and speed numbers represent maximum values among the three profile sizes.

Have an application?

The ER Series catalog (Catalog 1893/USA) provides a thorough sizing procedure to help you make the right choice. The catalog also includes a convenient Application Fax form to allow AAD's Application Engineering Department to assist you in providing the right solution. Fax the form to 1/330/334-3335. Our engineers are also available to answer any questions at 1/330/336-3511.



The ER Series features a hard-coat anodized aluminum body, Nylatron roller bearing wheels and angular contact bearings for screw support. The modular nature of the ER Series' design allows for easy connectivity with structural framing, such as ParFrame aluminum for building multi-axis motion systems.

ER Series Rodless Linear Actuator



Daedal... Bringing the *Future* to Today!

Current trends in the motion and positioning control industry indicate that customer expectations will continue to escalate, and they will increasingly demand that their requirements be satisfied promptly and *precisely*. They will no longer accept "off-the-shelf" or "out of the catalog" compromises as their only choice when seeking fast, economical solutions. By the year 2000 and beyond, customer demands will require suppliers to efficiently integrate specially engineered components with standard catalog components to produce uniquely-tailored, cost-effective solutions, and... they will expect them to be supplied quickly — as quickly as catalog products are offered today.

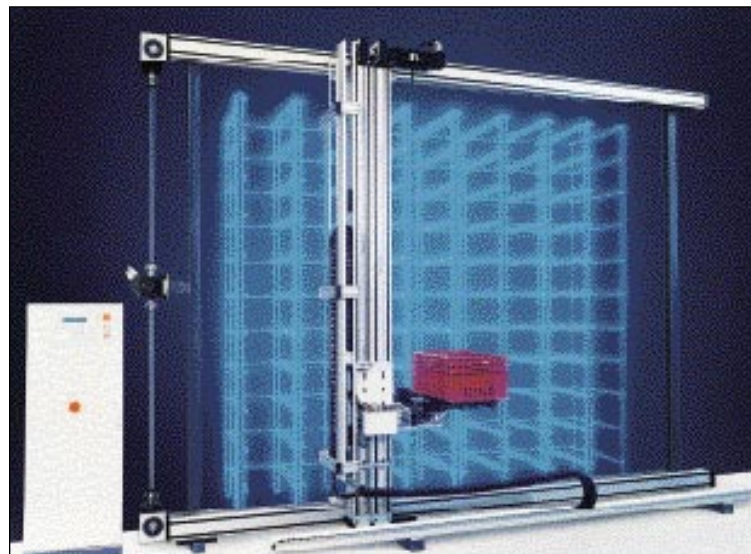


Daedal has Leaped Ahead to Bring the Future to the Present
An unrivaled breadth of catalog products, combined with concurrent engineering and agile manufacturing, enables Daedal to respond rapidly with effective solutions for specific needs. Daedal is today where the competition hopes to be at the turn of the century... delivering custom products and solutions that exceed customer expectations, in the

shortest time. Highly-precise multi-axis systems, specially designed, manufactured and tested, are routinely shipped to the customer within four weeks. Daedal can supply today's customer with the ideal solution in the same amount of time that the competition needs to provide "cookbook" products.

Some cost savings can be realized, however, by those customers whose requirements can be fulfilled with standard "catalog" items. Many single axis (X) and two axis (XY) applications, for example, can be satisfied by catalog products — with no compromise in the desired results. Once again, Daedal has positioned itself to exceed customer expectations with a broad product offering of linear and rotary tables, stages, drives, and accessories that offer superior performance, competitive pricing, and fast delivery.

Our manually driven slides and stages produce extremely smooth and straight (0.00008 inch per inch of travel) linear translation and are shipped within 3 days. Our motor-driven precision tables can repeatedly position within 50 millionths of an inch with payloads as high as 600 pounds over travel distances up to 60



Left: High-speed linear drives utilized for pick and place material loading and handling.

inches, and are completely tested and shipped within 10 days. Our HLE line of high-speed linear drives can shuttle payloads up to 1500 pounds to an unlimited number of locations at speeds up to 200 inches per second over travel distances to 10 feet and more... and they are shipped within 10 days.

From highly-precise positioning for the aerospace and semi-conductor industries to high-speed automated motion for the assembly and packaging industries, Daedal has provided total solutions — from catalog to custom — that are pleasing customers and will continue to exceed their expectations into the twenty-first century and beyond.



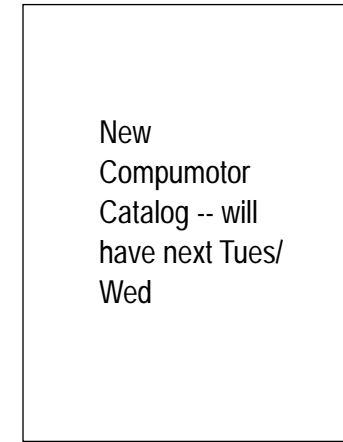
Above: A surface scanning machine that incorporates both catalog and custom Daedal tables to measure surface characteristics at the sub-micron level.

An Abundance of *New Products & Information* from Parker

CATALOG

Compumotor's New Step Motor & Servo Motor Systems and Controls Catalog

This 376-page catalog has been modified and improved to include even more motion control products available from Compumotor. New products



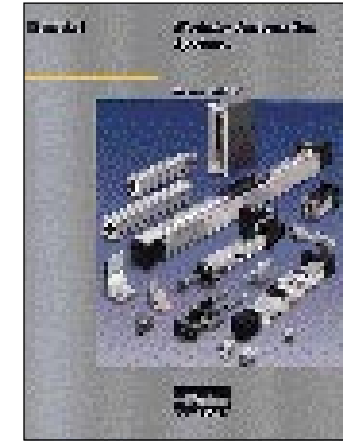
New Compumotor Catalog -- will have next Tues/Wed

included are the Linearserv, SV Series, and CE marked products. The catalog also covers AC brushless servo systems, step and microstep systems, linear step motor systems, controls, encoders, motion control software, and more. A detailed engineering section with application examples and calculations is inside as well.

CATALOG

Daedal's New Modular Automation Systems Catalog

This new 100-page catalog features Parker's "Hauser" line of high-speed linear positioners in conjunction with Parker actuators, structural framing, and step motor and



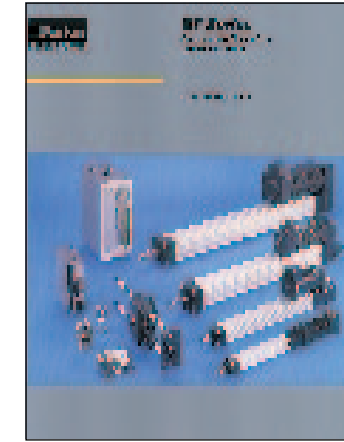
servo systems — to facilitate modular construction of turn-key automation systems.

The new catalog's easy-to-use performance charts, selection guides, technical tutorials, and application examples greatly simplify the component-matching and selection process. This unique catalog serves as an invaluable resource for finding simple, cost-effective solutions for building complex multi-axis automation systems.

CATALOG

Automation Actuator's Latest ET Series Linear Actuator Catalog

The ET Series Electric Cylinder combines proven performance in a unique, modular design. The newest ET Series catalog includes up-to-date perfor-



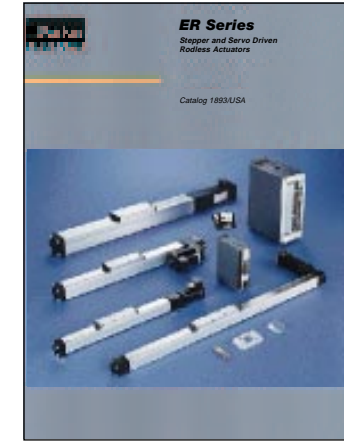
mance curves featuring the ZETA Series microstepping systems, as well as TQ and APEX Series brushless servo systems.

Informative and easy to use, the ET Series catalog makes actuator sizing and selection simple through speed and thrust performance curves. Performance curves take the guesswork out of calculating system capabilities. Detailed information on stepper and servo systems as well as actuator mounting options, accessories, and rod end styles are included.

CATALOG

Automation Actuator's New ER Series Rodless Actuator Catalog

AAD is pleased to announce the release of the ER Series rodless linear actuator. The ER Series catalog with its user-friendly format is now available.



The ER Series rodless actuator was designed to fit most any application. Three profile sizes, three drive transmissions and two bearing systems are available. The ER Series is ready to mount to stepper and servo motors as well as gearbox reducers. There are more than 20 motor mounting options available!

The ER Series catalog provides all of the information necessary to size and select a complete programmable system. Use the step-by-step sizing procedure for fast, efficient and reliable actuator selection. Convenient application fax forms are also included.

Free Literature is Yours for the Taking from Parker! Request Your Copies Now!

OEM750 Redefines Microstepping for High-Volume Applications

New System Replaces OEM350 Series and OEM650 Series

Since 1992, Compumotor has designed products specifically for original equipment manufacturers (OEMs). Compumotor's OEM Series motion control products meet the needs and requirements of high-volume applications.

- Performance
- Compact Size
- Competitively priced
- Customizable
- Flexible shipment schedules

The OEM350 (for high-inductance, low-current motors) and OEM650 Series (for low-inductance, high-current motors) were the first members of what is now a diverse OEM product family (microstepping/servo systems and controls). Technology enhancements and field experience has enabled Compumotor to redevelop these inaugural products into a single, more powerful package—the OEM750.

What's New in the OEM750

- **Anti-Resonance**—The OEM750 incorporates a subset of the circuitry used in the highly acclaimed ZETA Drive (1995 *Design News* Product of the Year). This feature eliminates mid-range



The OEM750 has the same footprint (dimensions) and mounting slots as its predecessors — the OEM350 and OEM650.

instability and allows users to take advantage of the full capabilities of our step motors.

- **More Motor Options**—The OEM750 eliminates the need for two products to handle low- and high-inductance motors. This feature allows users to stock or purchase one drive that will run a wide variety of motors. This gives users more choice in selecting a motor and an opportunity to pick the best motor for their application (no need to compromise based on inductance and current limitations).
- **Higher Reliability**—Compumotor's design engineers developed a new ASIC for the OEM750 and added more robust FETs, which significantly reduces the drive's internal temperature.
- **Broader Current Range**—The OEM750 can output 0.15A - 7.5A from one product.
- **Larger Motor Connector**—This new feature makes it easier to wire and install the OEM750.

OEM750 Compatibility and Quality

All of Compumotor's 6000 Series indexers (6200, OEM6200 and AT6200/AT6400) are compatible with the OEM750 Drive. The OEM750 can also operate with any non-Compumotor indexer/controller that provides a step and direction signal. An OEM750X, which combines the drive and indexer functionality into a single unit, is also available. The OEM750X replaces both the OEM350X and OEM650X. Compumotor's OS, RS, and OEM Series motors are designed to provide optimal performance with the OEM750 Series. Non-Compumotor motors that meet the following criteria may also be used successfully with the OEM750 Series.

- Inductance range of 0.2 mH - 80 mH
- Current from 0.15A - 7.5A (peak)

The OEM750 is completely backwards compatible with existing OEM350 and OEM650 applications. The OEM750 has the same footprint (dimensions) and mounting slots as its predecessors. The OEM750 also uses the same wiring configuration and drive set-up procedures as the OEM350 and OEM650. The cosmetic difference in the products is that the OEM750 features mini DIP switches instead of jumpers. This change was incorporated based on requests we received from our customers. The OEM750 has earned UL recognition and the CE (Conformité Européenne) Mark (Low Voltage Directive). The bottom line is the OEM750 is designed to be a turn-key replacement product—no learning curves or hidden glitches.

Recommended OEM750 Application Solutions

The OEM750, like all of Compumotor's OEM Series products, is designed from the OEM's point of view. Attention is given to the unique needs and requirements that these types of applications demand. The OEM750 is particularly well suited to solve applications that mandate the use of multiple drives that must fit or be mounted in a small space or enclosure. Based on our experience and the success of the OEM350 and OEM650, the OEM750 might be most effective in (but not limited to) the following motion control applications: semiconductor manufacturing, disk drive production, mechanical or electronic packaging,



OEM750 Availability

The OEM750(X) is available now. Compumotor will continue to take orders for the OEM350(X) and OEM650(X) until December 1, 1997 (all orders must be shipped by December 23, 1997). For detailed OEM750 Series information and specifications, request an OEM750 User Guide on the reply card and mail it to Compumotor.

Common Specifications for the OEM750 and the OEM750X

Parameter	Value
Power Input DC	24-75 VDC @ 2.0 A rms (motor dependent)
Performance Accuracy	±5 arc min (0.0833°) typical. Unloaded-bidirectional with Compumotor supplied motors. Other motors may exhibit different absolute accuracy. ±1 arc min (0.0167°) Loaded-in addition to unloaded accuracy, per each frictional load equal to 1% rated torque.
Repeatability	±5 arc sec (0.0014°) typical. Unloaded-one revolution returning to start point from same direction.
Hysteresis	Less than 2 arc min (0.0334°) unloaded-bidirectional.
Resolution	16 selectable choices: 200, 400, 1000, 2000, 5000, 10000, 12800, 18000, 20000, 21600, 25000, 25400, 25600, 36000, 50000, 50800
Waveform	Selectable. Allows waveform shaping for optimum smoothness or relative accuracy. Pure sine; -4%, -6%, -8%, -10% 3rd harmonic.
Amplifier Type	20 kHz fixed frequency, variable duty cycle pulse width modulated (PWM) Current controlled, bipolar chopper
Number of Phases	2
Output Current	0.15-7.5 amps current per phase peak (selectable)
Drive Supply Voltage	24-75 VDC (dependent on external power supply)
Standby Current Reduction	25%, 50% or 75% of selected motor current
Nominal Chopping Frequency	20 kHz
Max Stepping Rate	2 MHz max pulse rate; 50 rps max speed
Step Input	High-going pulse, 200 nsec min width; max pulse rate is 2 MHz; User-supplied driver for the step and direction inputs should be capable of providing a minimum of 6.5 mA to a maximum of 15 mA
Direction Input	Logic High = positive (CW) rotation—3.5-5.0V Logic Low = negative (CCW) rotation—0-0.4V User-supplied driver for the step and direction inputs should be capable of providing a minimum of 6.5 mA to a maximum of 15 mA. The direction input must be stable for at least 200 µsec before the drive receives the first pulse
Fault Output	Open-Collector/Emitter, Vce = 35 VDC, Vce sat = 0.3 VDC, Ic = 10 mA (max) Maximum dissipation = 100 mW Conducting = normal operation Non conduction = drive fault
Protective Circuits Short Circuit*	Phase-to-phase, phase-to-ground
Undervoltage	If DC supply drops below 24 VDC
Overtemperature*	If internal air temperature exceeds 158°F (70°C)
Environmental Operating Drive	32° F to 122°F (0°C to 50°C) Max allowable ambient temperature is 122°F (50°C). Fan cooling may be required if airflow is restricted. Maximum allowable heatsink temperature is 55°C.
Storage Humidity	-40°F to 185°F (-40°C to 85°C) 0 to 95% Non-condensing
Physical Drive Dimensions	5.0 x 3.6 x 1.6 in (127 x 91 x 41 mm)
Weight	OEM750: 0.72 lb (0.32 kg), OEM750X: 0.84 lb (0.38 kg)
Motor Type	Two-phase hybrid permanent magnet, 1.8°
Number of Leads	4, 6 or 8
Inductance Range	0.2 mH- 80 mH

* Drive shuts down in conditions listed. Power must be cycled or drive reset to resume operations.

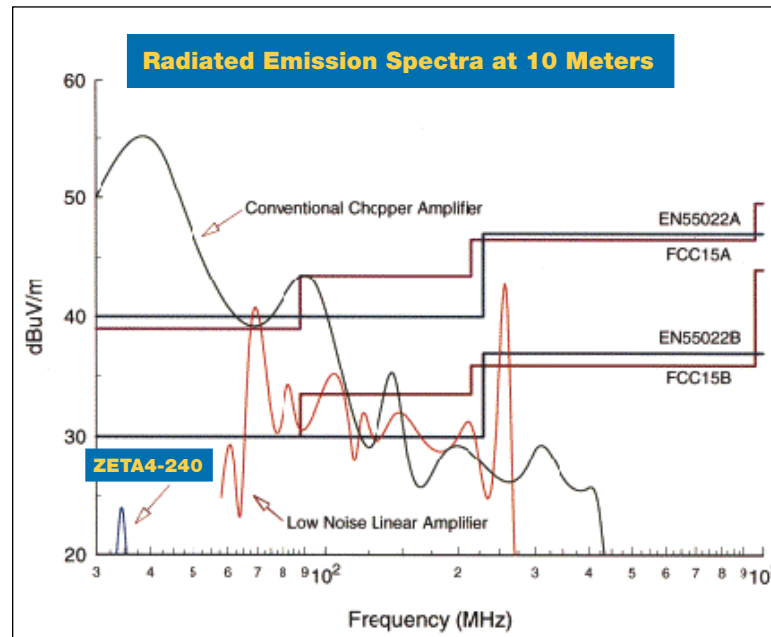


Compumotor Broadens Its Scope of **Microstepping**

New ZETA4-240 Meets National & International Low-Noise Standards For Low- and High-Power Applications

Compumotor's industry-leading ZETA Series has added a new member to its microstepping family—the ZETA4-240. This new drive meets the needs for global solutions: (1) CE (LVD and EMC) or Low-noise applications (2) High-Power and (3) Low-Power applications. The ZETA4-240 offers the same award winning performance features of its predecessor (and a few more!).

- CE Marked with Full Electromagnetic Compatibility (EMC) and Low Voltage Directive (LVD) Compliance
- Received UL (Underwriters Laboratory) Recognition
- Standard Step & Direction Input or CW/CCW Input
- Torque from 43 oz-in (0.3 Nm) to 1991 oz-in (14.1 Nm)
- Offering CE(LVD and EMC) motors with 10 ft. motor cables
- Input voltage range of 95-264VAC
- Active Damping (Patents Pending)—Provides damping ratios up to 0.5, enables higher acceleration, decreases motor vibration, increases shaft power
- Electronic Viscosity (Patents Pending)—Reduces settling time, audible noise and low-speed velocity ripple
- Anti-Resonance—Eliminates mid-range instability and provides damping ratios up to 0.2



The ZETA4-240 meets North America's FCC Class B emissions test and has received UL approval. This makes it an excellent choice for applications that have low-noise requirements due to sensitive measurement equipment (e.g., medical and disk drive applications, et al.).

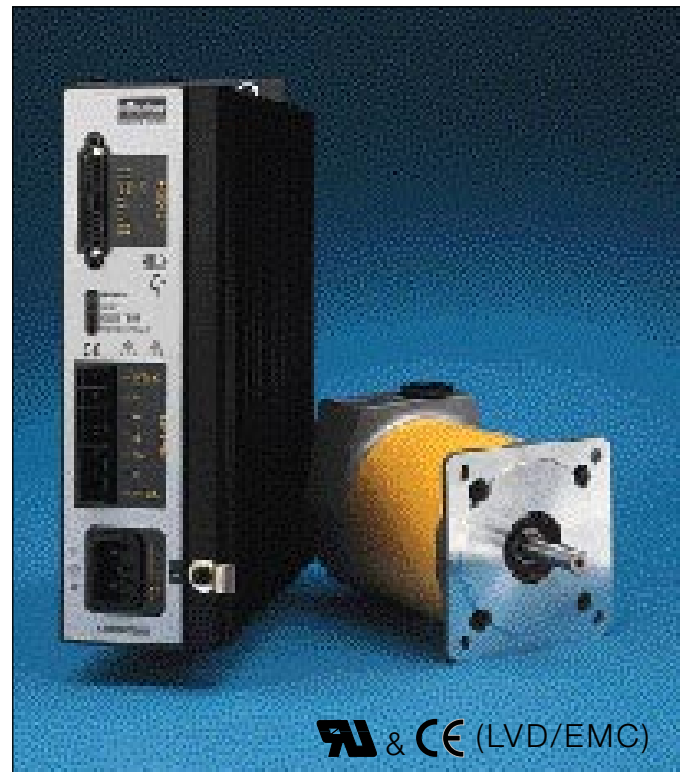
The ZETA4-240 also complies with the LVD (EN61010) and EMC (CISPR22/EN55022 Class B) Directives set forth by the European Union. Since the ZETA4-240 meets these rigid standards, it is ready for use in machines around the world that require CE Marking.

The ZETA4-240 Drive can be used for high- and low-power applications. For high-power applications, the ZETA4-240 can be operated at 240VAC and provide performance levels equivalent to an 8A drive [torque from 171 oz-in (1.21 Nm) to 1991 oz-in (14.1 Nm)]. For low-power applications, the ZETA4-240 can be operated at 120VAC and provide performance levels equivalent to the ZETA4 Drive [Torque from 43 oz-in (0.3 Nm) to 383 oz-in (02.7 Nm)].

ZETA4-240 Compatibility

This drive is compatible with all of Compumotor's 6000 Series indexers (6200, OEM6200 and AT6200/AT6400). The ZETA4-240 can also operate with any non-Compumotor indexer that provides either a step and direction or a CW/CCW signal.

Compumotor offers CE marked, Size 23, 34 and 42 frame motors for use with this drive. These are 2-phase hybrid permanent magnet motors (1.8°). When used with the ZETA4-240, these products constitute a complete CE Marked system (required in some areas and/or applications). The ZETA4-240 can also run non-Compumotor motors that meet the criteria specific to the application.



Meeting National & International Standards for Global Solutions

Compumotor's objective in designing the ZETA4-240 was to provide a high-power drive that runs directly from 240VAC and is fully compliant with national and international quality and safety standards.

ZETA4-240 Availability

The ZETA4-240 will be available soon. This product is featured in our new *Step Motor & Servo Motor Systems and Controls Catalog*. The catalog contains detailed specifications, speed/torque curves, and other important technical information about this and other Compumotor products.

Specifications for the ZETA4-240

Parameter	Value
Power Input	95–264VAC, 50/60 Hz
Performance	
Accuracy	±5 arc min (0.0833°) typical. Unloaded-bidirectional with Compumotor supplied motors. Other motors may exhibit different absolute accuracy. ±1 arc min (0.0167°) Loaded-in addition to unloaded accuracy, per each frictional load equal to 1% rated torque.
Repeatability	±5 arc sec (0.0014°) typical. Unloaded-one revolution returning to start point from same direction.
Hysteresis	Less than 2 arc min (0.0334°) unloaded-bidirectional.
Resolution	16 selectable choices: 200, 400, 1000, 2000, 5000, 10000, 12800, 18000, 20000, 21600, 25000, 25400, 25600, 36000, 50000, 50800
Waveform	Selectable. Allows waveform shaping for optimum smoothness or relative accuracy. Pure sine; -4%, -6%, -10% 3rd harmonic.
Speed/Torque	Provided in <i>Compumotor Catalog</i>
Motors	
Type	2-phase hybrid permanent magnet, 1.8 degree.
Breakdown Voltage (HIPOT)	1150VDC @ 120VAC input; 1900VDC @ 240VAC input
Number of Leads	4, 6 or 8
Accuracy Grade	3%
Inductance	0.5 mH minimum; 5 to 50 mH recommended range; 100 mH max
Dimensions	Provided in <i>Compumotor Catalog</i>
Amplifier	
Type	20 kHz fixed frequency, variable duty cycle PWM (pulse width modulated). Current controlled, bipolar type. MOSFET construction.
Number of Phases	2
Dimensions	Provided in <i>Compumotor Catalog</i>
Protection*	
Short Circuit	Phase-to-phase, phase-to-ground.
Brownout	If AC supply drops below 85VAC.
Over-temperature	Over-temperature shutdown fault at 131°F (55°C)
Auto Standby	If selected, motor current ramps to 50% of preset value if no step pulses are received for 1 second. Current levels are resumed upon receipt of next step pulse.
Automatic Test Function	This feature (used primarily for testing and verification of correct wiring) rotates the motor at approximately 1 rps in the negative (CCW) direction.
Step Input	High-going pulse, 200 nsec min. width; max. pulse rate is 2 MHz.
Direction Input	Logic High = positive (CW) rotation . Logic Low = negative (CCW) rotation. Direction input may change polarity, coincident with first step pulse.
CW/CCW Input	Dip switch selectable. High-going pulse, 200 nsec min width; max pulse rate is 2 MHz.
Shutdown Input	Logic High = amplifier disable. Logic Low = normal operation.
Reset Input	Logic High = drive held in reset. Logic Low = normal operation.
Fault Output	Conducting = normal operation. Not Conducting = drive fault.
Environmental	
Operating Drive	32°F to 122°F (0°C to 50°C) Maximum allowable ambient temperature is 122°F (50°C). Fan cooling may be required if airflow restricted.
Motor Storage	212°F (100°C) maximum motor case temperature. Actual temperature rise is duty-cycle dependent.
Humidity	-40°F to 185°F (-40°C to 85°C) 0-95%, non-condensing

* Drive shuts down in conditions listed. Power must be cycled or drive reset to resume operations.



Compumotor Expands "Made-to-Order" Brushless Servo Motor Line

Developed with the OEM in mind, Compumotor introduces a new addition to its SM Series servo motor family—the SM230. Continuing with the slotless construction, the motor features absolutely no magnetic detent torque. Repeatable, bi-directional motor commutation is ensured by the application of a commutation track encoder. This encoder also provides data channels while maintaining electrical isolation between the two encoder functions.

While flying leads are the "standard" wiring option, modern manufacturing techniques allow for special wiring options, such as connectors, lead length, ribbon cable, to be easily integrated with minimal impact on deliveries. Include special shaft modifications, gearheads, and/or windings and the motor becomes an integral component to your design.

SM230 Motors are available now. For additional information on these or any other SM Series Motor, contact Compumotor's Servo Motor Group at 1/800/358-9068.



Parameter	Units	SM230A	SM230B
Stall Torque Continuous ¹	lb-in oz-in	1.8 28.9	1.7 27.6
Stall Current Continuous ¹	amperes - rms	2.5	5
Rated Speed ²	rpm	7500	7500
Peak Torque ^{1,6}	lb-in oz-in	5.4 87	5.2 83
Peak Current, rms ¹	amperes	7.5	15
Torque @ Rated Speed ¹	lb-in oz-in	1.5 24	1.4 23
Rated Power—Output Shaft ¹	watts	124	124
Voltage Constant ^{3,4}	volts/radian/sec	0.081	0.0391
Voltage Constant ^{3,4}	volts/KRPM	8.52	4.09
Torque Constant ^{3,4}	oz-in/ amp rms	11.52	5.54
Resistance ^{1,3}	ohms	4.43	1.12
Inductance ⁵	millihenries	1.19	0.28
Thermal Resistance ¹	°C/watt	2.67	2.67
Motor Constant	oz-in/√watt	5.47	5.24
Viscous Damping	oz-in /Krpm	0.375	0.375
Torque - Static Friction	oz-in	0.3	0.3
Thermal Time Constant	minutes	30	30
Electrical Time Constant	milliseconds	0.27	0.25
Mechanical Time Constant	milliseconds	3.4	3.71
Rotor Inertia	lb-in sec ²	0.000045	0.000045
Weight	pounds	1.2	1.2
Magnetic Material		NdFeB	NdFeB
Winding Class		H	H

¹ @ 25°C ambient w/ 10x10x0.25 inch mounting plate, 90°C winding temperature. For 40°C ambient operation, reduce values by 12%. For operation without any thermal mounting plate, reduce current values by 28%

² With 500 ppr encoders. For 1,000 ppr encoders, derate to 6000 RPM. For higher speed operation, please contact factory.

³ ± 10%, line-to-line

⁴ Peak value

⁵ ± 30%, line-to-line, inductance bridge measurement method @ 1kHz

⁶ Peak current for 1 second with initial winding temperature of 60°C or less.

All specifications are subject to engineering change

Three-Axis Welder Makes Perfect Union of Parker Technology

Congratulations to Mike Vittoe, Senior Manufacturing Engineer for an aerospace corporation in southern California. Mike worked closely with his local ATC (Automation Technology Center) and Parker Automation engineers to replace a cumbersome manual positioning system that performed a CO₂ laser weld.

The old system suffered from a variety of problems: not stiff enough, leaking oil due to system wear, difficult and costly to operate, and limited capabilities. The manufacturer wanted a programmable 3-axis system that provided contouring and manual jogging. The ATC recommended and implemented a complete Parker solution. The following Parker products were used:



Location	Component	Drive
Structure	ParFrame Aluminum Extrusion	
X-Axis	Daedal 40602ET Square Rail Ballscrew Table	Compumotor ZETA4
Y-Axis	Daedal 506006ET Round Rail Ballscrew Table	Compumotor ZETA4
Z-Axis	Automation Actuator ETS50 Electric Cylinder with Rod Guide	Compumotor ZETA4

Compumotor's AT6400 4-axis PC-based controller and Motion Architect™ software are used to control the application. A joystick (JS6000) was employed to jog the X and Y axes (a switch on the joystick allows the Z axis to be jogged). The actuator included in the new system is mounted directly under the load and is equipped with a Parker rod guide assembly to reduce side load. The Z axis' travel capability is doubled with the electromechanical cylinder. The entire system is supported by the ParFrame aluminum extrusion enclosure, which provides space for a Windows™-based computer (where the stepper controller card is installed).

The manufacturer is now completing welding jobs in-house and increasing profits. Additional welding applications may be performed with the help of Compumotor's CompuCAM software (this was formerly done by a vendor at a cost of \$500 per unit). This program generates motion programs based on .DXF files. The programs can be stored and called on demand through Motion Architect.



Compumotor's Product Training Schedule
Expert Instruction By Product Specialists



Shorten the development time and improve the integrity and capability of your motion control application by attending a Compu-Course at Compumotor's facility in Northern California. Our hands-on, application-oriented training is conducted by Compumotor engineers. More than 100 designers, engineers, and users have benefitted from this unique training opportunity in the past year. Compumotor's trainers offer an invaluable experience and a wealth of motion control knowledge. Start your application development at a Compu-Course—you'll leave with solutions.

CC-1: 6000 Series & Motion Architect (Stepper)	CC-2: 6000 Series & Motion Architect (Servo)	CC-3: SX & ZX Training (Servo & Stepper)	CC-4: Model 4000 Training (Stepper)	CC-5: ZETA6104 Training (Stepper)
Designed for users of stepper controllers from the 6000 Series family. This five-day course is held on the following dates: Sept. 8-12, 1997 Nov. 3-7, 1997	Designed for users of servo controllers from the 6000 Series family. CC-2 is a four-day course to be conducted on the following dates: Oct. 6-9, 1997	CC-3 is a four-day course designed for SX and ZX users (applicable to Model 500 and most other X-language products, too). It will be held: Dec. 15-18, 1997	CC-4 is suitable for novice and experienced Model 4000 Controller users. Nov. 17-20, 1997	NEW! This 4-day course is designed for users of the new ZETA6104 Microstepping Drive/Indexer. Sept. 22-25, 1997 Dec. 1-4, 1997



Win a Free California Get-Away Weekend!

Compumotor Application Story Contest

It's simple and easy. Just complete a short entry form, briefly describe your Compumotor motion control application and include a picture of your machine/process. That's it! Any application can win. We'll select a winner during each issue and publish the winning entry in this publication.

Here's how it works:

1 Complete an *Official Compumotor Application Story Contest Entry Form* and return it to Compumotor. Get the form and detailed instructions by calling our new faxback system—(707) 586-8586

or call Compumotor's Marketing Communications Department at 707-584-2439.

2 Entrants must provide a completed form *and photo* of the application/machine. Entries for this issue must be postmarked by October 1, 1997. All entries shall become property of Compumotor. Compumotor ATCs are not eligible.

Here's what we're looking for:

- ☛ A complete and accurate description of your application and process
- ☛ A good, clear photo of your machine

The winner will receive a California Get-Away Weekend compliments of Compumotor.

The grand prize includes the following:

- ☆ Two round-trip airline tickets to San Francisco (or vicinity)!
- ☆ Accommodations for two nights at a Rohnert Park, CA inn or hotel (45 miles north of San Francisco).
- ☆ A tour of Compumotor's manufacturing plant (lunch included) and a chance to meet the engineers who designed your product(s)!
- ☆ A Compumotor Gift Pack (\$100 value)
- ☆ A free California Bay Area vacation!

First-place and second-place runner-up winners will receive Compumotor Gift Packs and a voucher for a free Compu-School (technical training seminar—\$1,000 value). Compu-School is conducted at Compumotor. Runners-up pay for airfare and accommodations.

To get an official entry form, call our new faxback system. Request document #2222.



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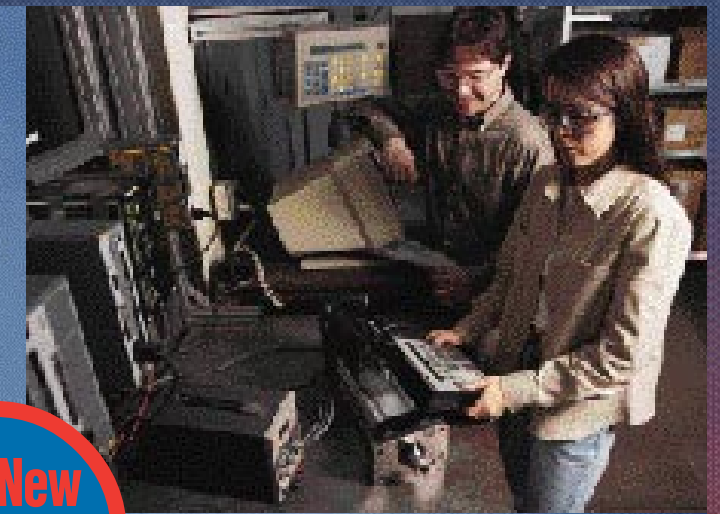
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AN UPDATE OF AUTOMATION TRENDS

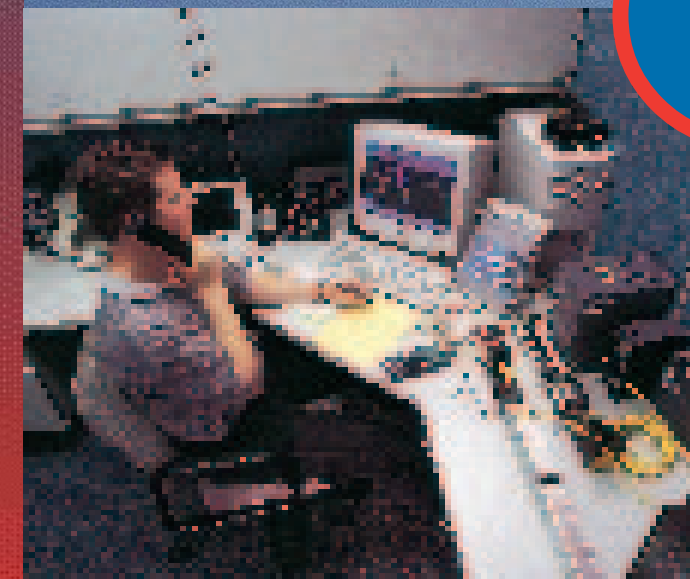
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