

## Overhung Load Adaptors

IMPROVE PAVEMENT  
PLACEMENT EQUIPMENT

Repaving asphalt streets and highways requires heavy equipment, including cold planers that cut eight feet wide by 12 inch deep swaths in old asphalt surfaces in order to remove them. These cold planer systems work at speeds up to four feet a minute cutting, granulating and conveying the loose asphalt into waiting trucks for recycling. By necessity, the power transmission systems in these cold planers are ruggedly designed to handle large amounts of asphalt and to operate for long periods without maintenance.



The hydraulic pump motor is connected to Zero-Max Overhung Load Adaptors.



The adaptors used in the Roadtec system have a special oil drain port to facilitate lubrication.



**Overhung Load Adaptors are an off the shelf device for increasing motor durability and life.**

Roadtec, an Astec Company, has manufactured pavement placement equipment for over 30 years. Its cold planers are used for asphalt removal and are designed to provide the optimum balance between horsepower, production and maneuverability. These versatile machines are capable of cutting depths to 30 cm and widths of two meters to over 2.5 meters. They also provide side-cutting operations and have bi-directional operation capabilities to achieve down cutting in the reverse direction of travel.

Roadtec's largest cold planer, the RX 50B, operates on three D-4 size tracks, providing a 2.5 meter cutting radius with crab steer, front-track steer and rear-track steer. It has a two-stage covered 86.4 cm wide front load-out conveyor with 50-degree swing to either side, for a high volume loading capacity.

Power from the main shaft of the 600 horsepower Caterpillar diesel engine travels into a hydraulic clutch and then to the grinding drum by a belt drive. A second pump on the same shaft provides the hydraulics for propulsion.

To ensure smooth operation of the auxiliary hydraulic systems in these cold planers, two Overhung Load Adaptors (OHLA) from Zero-Max are used, one mounted on each side of the engine. The larger OHLA (800 series) drives the pump that provides hydraulic pressure to operate the components that move the ground asphalt to the conveyor. The smaller OHLA (600 series) drives a pump that provides hydraulic pressure for other system operations, such as

steering and discharge conveyors.

"Without the Overhung Load Adaptors, too much stress was transmitted to the pump's bearings, which could result in premature and costly pump failure," says Chris McSharry, design engineer for Roadtec. "We'd heard about the Overhung Load Adaptors and did a bearing life scenario for our system using Zero-Max's estimated working life formula from their online catalog. These numbers looked good; plus we liked the idea of using a proven off-the-shelf module rather than trying to design a bearing support setup or our own from scratch, which would have been more expensive and time consuming."

The drive setup that McSharry and the Roadtec engineers devised positions the OHLA units at 180 degrees from each other. This balances the force applied to the front of the engine's crankshaft. The model 600 has two V-belts on one pulley connecting it from the engine while the model 800 has three V-belts on one pulley connecting it to the engine.

The OHLA 600 used in Roadtec's system has an SAE-B face mount and weighs 30 pounds, and the 800 has an SAE-C face mount and weighs 55 pounds. Both sizes feature rugged housings made from 25,000 psi tensile cast iron with shafts of 130,000 psi stress-proof steel. Both have heavy-duty tapered roller bearings and operate the Roadtec system at a 1:1 ratio at speeds up to 2,100 rpm.

"The OHLAs give us a solid,

permanent mounting surface, which aids in the overall stability of the system," McSharry says. "By eliminating the stress and overhung loading, both the pump motor and bearings perform nicely without any threat of failure for either. The entire drive system runs freer with the OHLAs and with less power utilized. These cold planers put out a lot of power, so the added stability from the OHLAs really promotes a smoother operating system."

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**Smart Ethernet Drives**

ADD FLEXIBILITY TO ADVANCED MOTION CONTROL SYSTEM BUILDING



The latest generation of smart drives from Baldor Electric Company offers economic and space-saving solutions for many common single-axis automation requirements. They feature an Ethernet interface compatible with

Powerlink, the deterministic Ethernet-compatible motion control standard.

*Mint Lite*, the new programming capability, can be fitted free of charge on all Baldor MicroFlex e100 and MotiFlex e100 single- and three-phase drive ranges. The drives come in a range of power ratings up to 33.5 A, with higher ratings planned for the near future. Applications for the drives include controlling rotary and linear servo motors, linear motors, closed-loop vector motors and in V/Hz control modes.

A range of basic motion programming requirements are supported by the embedded *Mint Lite*, including performing relative and absolute moves, S-ramp profiles, jog and homing movements, changing target positions on the fly, registration moves and reacting to real-time trigger events. The programming facility enables standalone drives to provide solutions for common automation and machinery tasks, such as cutting or feeding to length, indexing axes, simple pick and place motion and machine adjustments like changing guides or backstops to reconfigure machinery for new batches. These capabilities are requirements in various manufacturing and processing sectors, including food and beverage, packaging, pharmaceutical, electrical and electronic equipment, printing and wood/metalworking.

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# product news

The drives allow more flexibility in PLC interfacing. Since Baldor's drives are programmable, the standard drive profile can be adapted, which can simplify the communications process or optimize drive behavior for specific applications. The TCP/IP-compatible Ethernet interface makes it simple to link into Ethernet factory networks to change product recipes, report production metrics or other uses.

Baldor's MicroFlex e100 and MotiFlex e100 drives come standard with built-in I/O—including fast latch inputs for registration applications—as well as CANopen manager capability for supporting distributed I/O expansion and HMI interfacing. The MotiFlex e100 drives feature card slots for more local I/O expansion and fieldbus connectivity. The fieldbus modules extend connectivity options to external PLCs, supporting interfaces such as

Ethernet/IP, Profinet-IO, Profibus and DeviceNet. These features allow the drives to be configured cost effectively for single-box solutions in automation applications.

The local intelligence provides flexible system building capabilities when used in a Powerlink system. Critical events can be acted on directly, which does away with the impact of network and controller scan time latencies, while quicker response of critical axes can be translated directly into higher throughput. Baldor fits *Mint Lite* programming capability as standard, providing a more economical solution for machine builders who configure systems with high numbers of motion axes.

Baldor's development environment, *Mint WorkBench*, includes development and configuration tools for the drives at no additional cost.

These smart drives complement

Baldor's existing Powerlink network control possibilities, which include a traditional central controller available for varying numbers of motion axes and a plug-in controller for drives called *Mint Machine Module* that control either two or five axes. The plug-in control card provides full access to the capabilities of the *Mint* language, and it can be programmed to perform sophisticated motion functions, like gearing and cams.

View more production information at [www.baldormotion.com/products/servo-drives/overview.asp](http://www.baldormotion.com/products/servo-drives/overview.asp)

#### For more information:

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## Cleveland Gear

### BROADENS PRODUCT OFFERINGS

A line of shaft mount reducers and accessories is available now from Cleveland Gear Company, including tapered bushing kits, belt guards, torque arms, motor mounts and backstop assemblies.

These drives are suitable for various material handling applications. They come in eight CGSM sizes, 2–9, input horsepower from 1/3 to 125 and output rpm from 4–6 up to 118–125. The shaft mount reducers meet AGMA Class I, II or III service for motor horsepowers up to 125, with standard ratios of 15:1 and 25:1.

Twin tapered bushing kits are sized

for CGSM reducers and other manufacturers' shaft mount drives, with bore diameters from 1 5/16 inches to 4 15/16 inches. The kits install quickly and support both sides of the reducer. All tapered bushing kits come with fastening bolts and a full-length key.

#### For more information:

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3249 East 80th Street  
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[www.clevelandgear.com](http://www.clevelandgear.com)



## Bison

REDUCES  
MOTOR'S VOLUME 30 PERCENT



In response to trends for smaller OEM equipment with higher power output, the 100 mm AC motor line from Bison Gear and Engineering Corp. offers 1/8 horsepower in 30 percent less volume than previously available. The four inch diameter single phase motors have been mated to Bison's 750 Series right angle gearing to offer up to 104 inch-pounds (11.8 N-m) of continuous torque in a compact package with three-wire reversible hookup and a range of mechanical options.

The 100 mm AC Right Angle Gearmotors are powered by 115 volt, 60 Hz single-phase TEFC permanent split capacitor motors and offered in six standard versions with gear ratios from 5.2:1 to 50:1 and fixed output speeds from 327 to 28 rpm, respectively. Continuous output torques range from

12 to 104 inch-pounds (1.4 to 11.8 N-m). The gearmotors are available in a 3/4 inch (19 mm) hollow shaft configuration that is easy to mount. Another option is replaceable single- or double-output stub shafts that can either be foot or face mounted. A rear motor shaft extension can be fitted with an optional power-off brake.

These motors are appropriate for use in packaging equipment, conveyor systems, food service and stationary agricultural equipment, as well as other specialty machinery applications.

"We believe these compact, high output AC motor designs will find many new applications where space is at a premium, but where motor

power cannot be sacrificed," says Robert Lewton, electrical design engineer at Bison Gear. "This right angle gearmotor offering is the second family of Bison products to benefit from the new 100 mm AC motors. This being Bison's 50th anniversary year, we will continue to expand this innovative new 100 mm AC product line, and we will follow that up as well with other exciting new products from Bison this year."

### For more information:

Bison Gear and Engineering Corp.  
3850 Ohio Ave.  
St. Charles, IL 60174  
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## Proximity Sensor

MEASURES  
WITHOUT TOUCHING TARGET



The KD-2446 high-precision proximity sensor system from Kaman Precision Products offers lead-free RoHS compliance in a compact DIN package that is simple to install. Featuring a 10 KHz analog output and threshold-adjustable 3.3 KHz switched output, the KD-2446 is a flexible solution for high-speed automated manufacturing and process control applications.

The KD-2446 performs with 0.0008 percent FS resolution and 0.56 percent FS switch point hysteresis. With CE and RoHS compliance, the system is appropriate for OEM applications with worldwide distribution, including displacement, vibration, sorting and event capture.

Using inductive, eddy current tech-

nology that measures without touching the target, the sensor system also offers high performance with both ferrous and non-ferrous targets. It consists of two sub-assemblies: the sensor with integral cable and the signal conditioning or electronics module. Input voltage is variable from 12 to 24 volts DC, and gain is adjustable for up to 22 volts output, with 24 volt DC input.

The Kaman KD-2446 system comes standard with one of two production sensor configurations, 9C or 5CM. Both sensors are rated for continuous operation up to 400 degrees Fahrenheit.

### For more information:

Kaman Precision Products  
Phone: (800) 552-6267  
[www.kamansensors.com](http://www.kamansensors.com)

## Software Upgrade

CREATES  
3-D MODELS IN MINUTES

Cobham Technical Services launched a 3-D version of its rapid electromagnetic design tool for rotating electrical machines, the *Advanced Machines Environment*, that combines finite element analysis (FEA) simulation with a design entry system that creates full 3-D models of electric motors or generators in less than five minutes. The software is an application-specific toolbox of Cobham's *Opera* electromagnetic simulator.

FEA techniques allow users to simulate design concepts with accuracy, but it can take hours to build a 3-D model of a complex product like a motor. The 3-D *Advanced Machines Environment* provides a front-end to the electromagnetic simulator that speeds design entry by "fill in the blanks" dialog boxes. Users choose the form of motor or generator they want to design from a list of all common types and variants. By entering a list of 10 parameters or so to define mechanical geometry, material properties and electrical data, the 3-D models are then automatically created. The complete design entry process can be completed in less than five minutes.

Cobham Technical Services has offered this software tool in a 2-D format for several years, and the extension to 3-D allows developers to model an entire machine, which provides a comprehensive simulation that takes marginal factors, like end winding and fringe effects, into account.

The 3-D *Advanced Machines Environment* comes with design templates for common rotating machinery, including AC induction, brushless, permanent magnet and switched reluctance, plus synchronous motors or generators. The 3-D version also introduces support for axial flux electrical machines, which use a geometry that

can't be represented in 2-D. Users can also choose numerous design variants for different machine types, like choice of rotor styles.

Users also have open access to the scripting codes that generate the models and can modify them at will to create a proprietary automated design process. A material properties library is included in the software for speed.

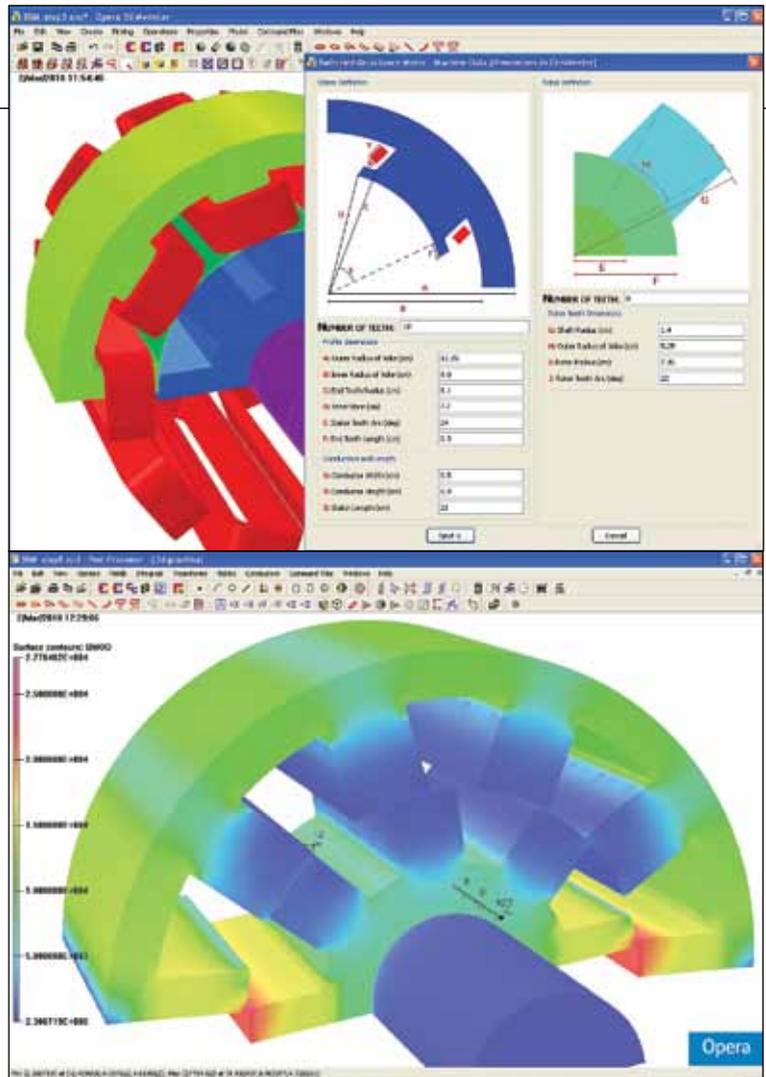
The *Advanced Machines Environment* provides users with post-processing capabilities to simplify the analysis of results. Commonly required manipulations of simulation data are provided as standard, including the torque produced as a function of position. Design ideas can be tested and optimized easily by varying the values of model parameters. Cobham offers the software with an optimization tool that will automatically select and manage multiple goal seeking algorithms to find the best

solution to a design problem.

Cobham sees this introduction as significant in the current motor and generator market that is actively engaged in pushing the energy efficiency of designs as far as possible. "This application-specific 3-D finite element tool provides a simple means of enhancing and speeding the design process, and is particularly relevant at a time when the market is demanding technological innovation," says Alex Michaelides, of Cobham Technical Services.

### For more information:

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3-D finite element models of generators and motors can be produced in minutes using a new design tool from Cobham Technical Services.

## Rotary Encoder

OPERATES AT HIGH SPEEDS

The MSR 40 is a modular steel tape rotary encoder from RSF Elektronik that measures applications with diameters of six inches (150 mm) to six feet (about 2 m). Available in North America through Heidenhain Corporation, applications for this ring encoder include rotary tables, telescopes and medical instrumentation.

The steel tape of the MSR 40 uses the single-field scanning principle with 200  $\mu\text{m}$  grating pitch and high achievable angular resolution for simpler mounting. The system has  $\pm 30 \mu\text{m}/\text{m}$  accuracy with operating temperature 0 degrees Celsius to + 50 degrees Celsius. The encoder operates at high speeds, especially in large measurement applications.

The MSR 40 encoder links the ends of steel tape together with one or two joining mechanisms, depending on the application. Measurement through a full 360 degrees is possible. An MOR version uses a steel ring tensioning cleat for encoders mounted to a steel surface, which allows for thermal expansion. An MER version uses a rubber gasket with a low-profile tensioning cleat for other mounting surfaces.

### For more information:

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Depending on the shaft diameter, up to 20,000 line counts are available on the MSR 40. Each version offers quasi-absolute positioning via distance-coded reference marks or homing via a single reference mark. The encoder is available in standard and custom sizes.

## High Capacity Torque Limiter

USES VIBRATION DAMPING JAW TYPE COUPLING

The ST2 series torque limiter from R+W allows for one compact unit to be installed, saving space and cost with a high horsepower driveline that normally requires modifying or purchasing a customized flexible coupling or fabricating a shaft adapter to allow for standard coupling use. Mechanical torque limiters are often implemented after the original equipment has been designed or installed, making space a premium.

The ST2 uses a vibration damping jaw type coupling in conjunction with a resettable torque limit function. After reaching a preset disengagement value between 738 and 118,000 ft-lbs, the coupling fully disengages and freely rotates over a high strength internal bearing until the machine shuts down. This helps to avoid any overload damage to gearboxes, shafts or other parts.

Resetting the coupling involves snapping the individual plungers back into engagement with a pry bar or mal-



let. These safety couplings have four body sizes and anywhere from three to nine plungers, depending on torque setting. The adjustable plungers can be added or removed after installation in case of miscalculation of the torque value release. The ST is also available as a pure torque limiter or with integral gear coupling or disc coupling.

### For more information:

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## RA Worm Gearboxes

OFFER MULTIPLE MOUNTING CONFIGURATIONS



The Groschopp NEMA Right Angle Worm Gearboxes with hollow output shafts allow options for right, left or dual shaft configurations. RA 40, RA 50, RA 63, RA 75, RA 90 and RA 110 are in stock.

The gearboxes are available in 5:1 to 100:1 ratios, input power from 1/15 to 10 hp and torque range from 5 to 6,000 in/lbs. They are constructed from lightweight aluminum and have high-thermal-capacity, die-cast aluminum housings designed for efficient heat dissipation. All housings are powder-coated for a durable, corrosion-free finish.

Other features include flexible configurations for foot, flange and shaft

mounting with optional torque arm; industry standard NEMA input flanges; lifelong, synthetic lubrication; a symmetrical, hollow output shaft to facilitate gearbox mounting and plug-in shafts; and ground finished worm shafts. Sizes 90 and 110 are supplied with tapered roller bearings on the worm gear.

### For more information:

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## Haydon

### ADDS THIRD ACTUATOR SIZE

The G4 19000 Series Can-Stack Stepper Motor Linear Actuator is the third linear actuator size added to the Haydon line of high output can-stacks offering high force output and reliability.

The 19000 Series is a 20 mm linear actuator in the G4 line of products with the same improvements as the recently released 25 mm and 36 mm linear actuators. Technical enhancements include optimized stator tooth geometry, high energy neodymium magnets, custom engineered plastics and larger ball bearings for greater rotor support and high axial loading.

With a high linear force-to-size ratio, the G4 19000 Series is appropriate for precision linear motion in various applications, including medical equipment, bar code scanning devices, printing equipment, laboratory instrumentation and other mechanisms



requiring high force and extreme durability from a small linear actuator package. Captive, non-captive and external linear configurations are all available.

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## Commercial Elevator Double Brake Developed

In response to new safety measures that require passenger elevators to have double redundant braking systems, Ogura Industrial Corp. has developed the double MNB brake for commercial elevators.

The MNB consists of two identical brakes mounted on one adaptor flange. The brakes are holding only, so when they are required to come on, both operate simultaneously. In the event one of the brakes has a problem, the other is designed to handle the required

torque load. Both brakes have limit switches to indicate when the brake is either engaged or disengaged.

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