GEMCO®

FABRICATION AUTOMATION CAPABILITIES

Stamping Press Control & Automation Solutions

Buy Fully Automated Presses.....

OR *AUTOMATE THE PRESSES YOU HAVE!*

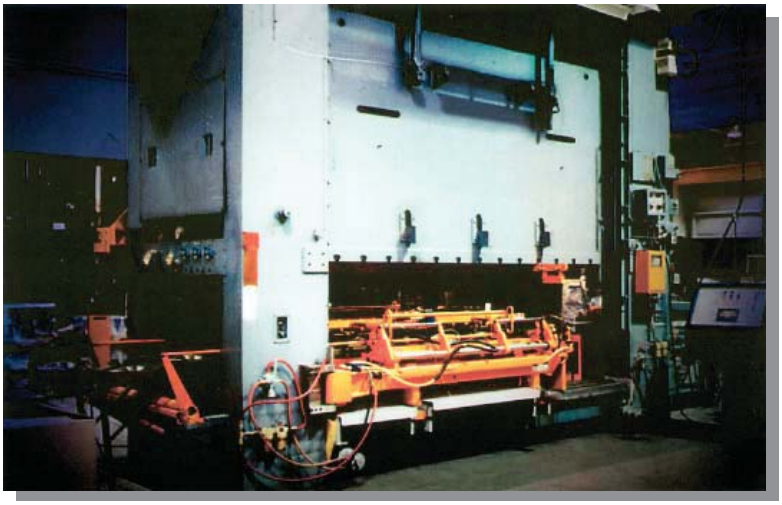
With Batch-Run Manufacturing, JIT Delivery And Tighter Product Specifications... The Decision Is No Longer Should You Automate,

BUT RATHER HOW TO AUTOMATE YOUR STAMPING PRESSES TO STAY COMPETITIVE.

AMETEK, under our **GEMCO**™ brand name, has been supplying control and automation solutions for mechanical presses for over 35 years. We have a unique product and system mix that allows you to select the level of automation you need to stay profitable.

We have also discovered that automation without effective monitoring can be costly. Therefore, we have “damage control” products and system features that allow you to monitor your automated systems.

THIS BROCHURE IS DIVIDED INTO FOUR SECTIONS:



- **Press Control**
- **Press Automation Products**
- **Full Press Automation**
- **Damage Control**

Others supply you with what they have...

WE DELIVER WHAT YOU NEED!

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CHALLENGE.....

At the heart of most press control circuits is a cam switch providing an accurate and reliable indication of crank shaft position. Therefore, the challenge is to have the best, most rugged cam switch on your press.

SOLUTION

THE GEMCO SERIES 1980 ROTATING CAM LIMIT SWITCH

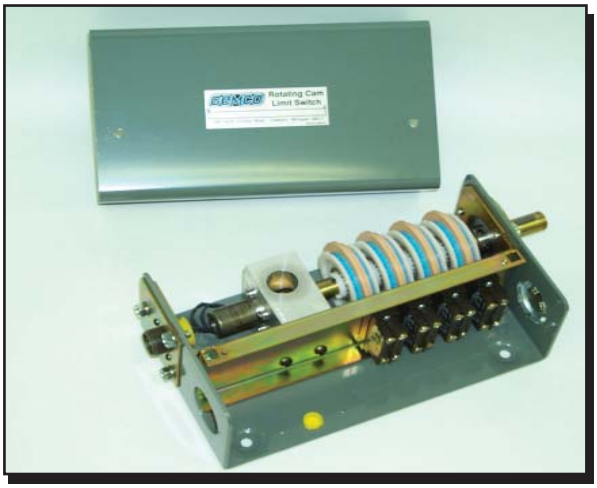
An Industry Standard For Over 35 Years!

GEMCO Series 1980
Rotating Cam Limit Switch

The Series 1980 Rotating Cam Limit Switch is an industry standard for cam directed press control systems. In fact, the majority of all the cam switches used on presses in the United States are **GEMCO** cam switches. They are rugged, easy to install, quick to adjust and field proven. In addition to our cam switches, we are unique in supplying them with internal resolvers, encoders or tach generators to run auxiliary automation features.

SOLUTION

THE GEMCO SERIES 1980 ROTATING CAM LIMIT SWITCH with RESOLVER



GEMCO Series 1980R
Rotating Cam Limit Switch with Resolver

Custom cam switch packages can include:

- 3 to 4 cams for top-stop, carry-over and anti-repeat control circuit inputs.
- Internal resolver for use by programmable limit switch or die protection module – electronically compatible with most PLS and die protection modules.
- Internal tach generators or pulse encoders for use by the press control, brake monitor modules or VFD feedback on variable speed presses.
- Encoders for positional or velocity feedback to PLC based pressline control systems.
- DeviceNet option allows position and rpm data to be communicated on the DeviceNet network.

All units come backed with a Industry Leading 3-Year Warranty!

CHALLENGE.....

The goals for any press automation project is to reduce die change and setup time and to better manage, coordinate and synchronize automation hardware such as feeders, oilers, blowoffs, robotic arms, etc. for greater press efficiency and part quality. But you may not need a full automation package to achieve these goals.

The GEMCO line of press automation products allow you to select the level of automation you need today, and the flexibility to add additional automation devices later.

SOLUTION

THE GEMCO SERIES 2110 SHUT HEIGHT MONITOR

Reduce Die Change Time by Up To 40%

The Shut Height Monitor gives you a highly accurate readout of shut height as you jog the shut height motor or manually adjust the shut height mechanism. Once proper shut height is determined, the readout can be recorded for use the next time the die is used in the same press, significantly reducing setup time and the number of test parts.

The GEMCO Series 2100 Shut Height Monitor

- Decrease hit-to-hit downtime / reduce scrap
- Position repeatability of ± .001”
- Resolver or LDT inputs
- All metal case, rugged construction
- Optional Analog or Digital outputs
- Serial and parallel outputs for interface to supervisory control systems

SOLUTION

THE GEMCO SERIES 1996 RAM-SET™

The Ram-Set allows you to automate the shut height adjustment process. Once the shut height has been determined, the information can be stored in the Ram-Set’s non-volatile memory under a die code number. Simply enter the code and the shut height motor is activated, automatically setting the exact shut height for that die.

- Consistently sets shut height to ± .002”
- Serial interface to supervisory control systems
- Store up to 500 die numbers /shut height values
- For use on single and double action presses
- Absolute linear position feedback to .001”

SOLUTION

The GEMCO Series 1746R & L Resolver & Transducer Module

The Series 1746R PLC Resolver Module is a resolver based unit that incorporates Allen-Bradley licensed technology for complete compatibility with A-B Series 1746 I / O chassis.

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The unit monitors machine / position and delivers absolute position data at 12 bit (4,096 count) resolution to the SLC processor. Standard “Turns Counting” software allows a single turn resolver to be used in multi-turn applications like shut height monitor or control.

Brake monitoring in metal stamping applications. In this configuration, automatic calculation of stop time and stop angle is transferred to the I/O image table. In addition, two programmable time limits are available to monitor maximum stop values: the first as a potential maintenance warning, and the second as an error if the press exceeds the programmed maximum acceptable stop time. Warning bits are transferred directly to the I/O image table.

The Series 1746L PLC LDT Module is a magnetostrictive linear displacement transducer (LDT) based unit that incorporates Allen-Bradley licensed technology for complete compatibility with A-B Series 1746 I/O chassis. The unit monitors machine position and delivers absolute position data to the SLC processor in inches to 0.001” or in millimeters to 0.01mm and velocity data. All power for the LDT is supplied directly from the 1746 LDT Module. Other features include position freeze, movement fault detection and programmable overtravel limits for use in pressroom shut height monitoring.

SOLUTION

The GEMCO Series 1995B PLS with Brake Monitor

Designed exclusively for press operations, the resolver based Series 1995B PLS gives you six programmable output relays directly from the back of the keypad module and is expandable to 30 outputs. This system is used to synchronize feeders, oilers, blowoffs, robotic arms or any other automation features to press crank shaft position. In addition, it has continuous brake monitoring that complies with OSHA requirements.

- Programmable motion detect output relay.
- Programmable speed compensation automatically advances or retards output on variable speed presses.
- Brake monitor provides continuous visual indication of stopping time and relay output when max. stop time is exceeded.
- Fault-check, self-diagnostics monitor: resolver, microprocessor, interconnecting cables.
- The linear displacement transducer version is ideal for hydraulic press automation.

SOLUTION

The GEMCO Series 2500 PLS with Brake Monitor

The Resolver based 2500 PLS gives you eight programmable outputs directly from the back of the unit, and is expandable to 64 outputs. This system is used to synchronize feeders, oilers, blow offs, robotic arms or any other automation features to a press crankshaft position. In addition, the output relays can be configured as either a limit switch output or a die protection input, the unit also offers a continuous optional brake monitor.

- Programmable scale factor.
- Programmable motion detect output relay.
- Programmable speed compensation automatically advances or retards outputs on variable speed presses.
- Brake monitor provides continuous visual indication of stopping time and and relay output when max. stopping time has been exceeded.
- Fault-check, self-diagnostics monitor: resolver, microprocessor, and interconnecting cables.
- Die protection, the ability to monitor a part as it progresses through the die.
- Multi-program, 15 job storage.
- Labeling of I/0, the ability to assign a user defined name to each input and output. Times based outputs function the same a normal outputs, except they turn on according to crank position and turn off according to time.

FULL PRESS AUTOMATION

CHALLENGE.....

Full press automation means different things to different businesses. How do you find an automation system that is comprehensive, but can also be customized to your press operations, at a price you can afford?

Rugged GEMCO Resolver

Press-Set Relay Output Board

Press-Set Automation Controller

SOLUTION

The GEMCO Series 1992 Press-Set™

Full Press Automation at 1/3 the Cost of the Competition

The resolver based **Series 1992 Press-Set Automation Controller** is a modular design that allows you to select features and options to reach the level of automation your business needs to stay competitive.

The Series 1992 has a 16 channel programmable limit switch and 12 programmable and 3 static die protection inputs.

Features:

- 200 job setup storage for immediate recall of limit switch, die protection, shut height, counterbalance and feeder setup parameters based on die code number.
- Stroke, batch and total counters.
- Serial interface to supervisory control systems.
- Brake monitor continuously displays stopping time and provides relay output if max. stop time is exceeded.
- Speed compensation advances/retards selected outputs as press speeds vary.
- Fail-safe control relays conform to OSHA specifications for use as inputs to press control circuits.

Options:

- Automatic Shut Height Monitor or Control.
  -Rugged Magnetostrictive LDT Sensor
  -Universal LDT Mounting Bracket.
  -Cable Termination Kit.
- Serial interface to most coil feeders for automatic setup of feeder operating parameters.
- Serial interface to supervisory control systems.

OSHA uses our Semelex™ Safetimeter™... SHOULDN'T YOU?

CHALLENGE.....

OSHA requires that press stopping time, as well as related operator safety device position and operation be monitored on a periodic basis.

SOLUTION

GEMCO Series 1999 Semelex Safetimeter®

Press setup demands that the operator safety devices be properly set and tested to OSHA standards.

Our portable Semelex Safetimeter is designed to be taken to the press to test operator safety devices. This is the same unit that OSHA uses when they perform tests in your facility.

- Checks press stopping time and calculates safe distance for safety devices.
- System accessories allow testing of safety device response time as part of setup.
- Comparison of down stroke and upstroke stop times can verify counter balance adjustment.
- Essential to properly set up light curtains, safety mats, hand controls and other initiation interlocks.

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AMETEK

CHALLENGE.....

The need for Automation is greater today then ever before. When press automation works, you remove many of the hands on functions in press operations. Press operators become managers of the process, automated systems do the work.

SOLUTION

GEMCO Series LDTs
Analog, Digital & SSI Outputs

To Meet Your Automation Needs

The GEMCO line of Linear Displacement Tranducers, (LDT) are designed to withstand the harsh environments commonly found within the Stamping Industry. This line of magnetostrictive LDTs can be adapted into the mechanics of the press to give continuous, absolute linear feedback. Numerous package styles & outputs are available to choose from for seamless integration into the host control.

955 BRIK Gen III & 955S Smart BRIK

- Low profile LDT.
- Analog outputs, 0-10 VDC, +/-10 VDC, 0-5 VDC, +/- 5 VDC, 4-20mA.
- Digital output Start/Stop, Control Pulse, and Variable Pulse (PWM).
- Programmable zero and span.
- Stroke length to 180".
- Wide input voltage range.
- Optional floating magnet.
- Programmable zero & span.

950MD Mill-Duty Housing

- Ideal for retrofitting existing hydraulic cylinders.
- Stainless steel mill duty "rod style" protective housing.
- Stroke length to 20 feet.
- Optional ports for air, water or vortex air cooling.
- Optional bellows boot.

953 VMAX Linear Displacement Tranducer

- Analog outputs, 0-10 VDC, +/-10 VDC, 0-5 VDC, +/- 5 VDC, 4-20mA.
- Digital output Start/Stop, Control Pulse, and Variable Pulse (PWM)
- SSI (Synchronous Serial Interface) 24, 25, or 26 Bit, Binary or Gray Code, Synchronous or Asynchronous Mode.
- Shock resistant to 1000Gs (lab tested).
- Vibration resistant to 30Gs (lab tested).
- Removable cartridge.
- IP68 rating.
- Stroke length to 300".
- Input power range is 7 to 30 VDC @ 1 watt typical.
- Weather/contaminant resistant.
- Programmable zero and span.
- Diagnostic Tri-Color LED.
- The linear displacement transducer version is ideal for hydraulic press automation.

956 BLOK Housing Option for 955 Series LDT

- Two chamber industrial rod and barrel style enclosure for 955 series LDTs.
- Stroke length to 36".
- Electronics are isolated in a chamber with an IP67, optional IP68 rating.
- Optional spherical rod ends.

7330 Pro-Stik II

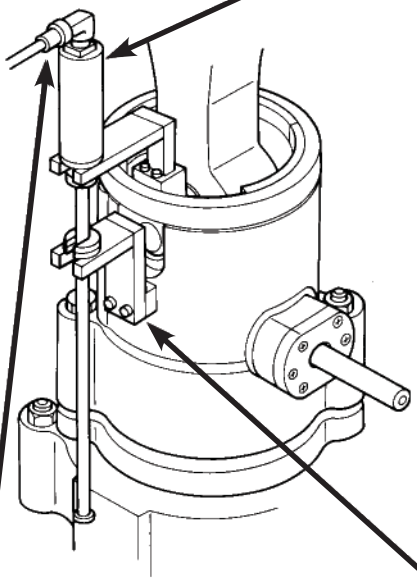
- Stainless steel "headless" rod style.
- Ideal for liquid level sensing.
- Intrinsically safe, 4 to 20ma output.
- Wide range of float options.
- All welded 316 stainless steel construction.

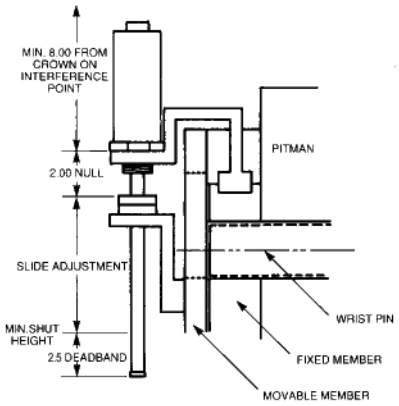
GEMCO Series 952 BlueOx™ Digital LDT

- Industry's toughest transducer– 2,000 G hammer strikes without false signaling.
- 30 G random vibration test without false signaling.
- Resolution to .001".
- Repeatability to .001% of full stroke.
- Up to 144" in 0.1" increments.

TRANSDUCER MOUNTING:

The proper mounting of the linear displacement transducer is critical to insure proper operation of the system. While no hard and fast rule applies to mounting the transducer, the following should be considered: A) The transducer should be mounted between a fixed portion of the ram (typically above the wrist pin on straight side presses) and the slide (holding the magnet). Because of variations from press to press, the transducer/magnet mounting brackets are not provided. These brackets should be made from cold rolled steel and configured such that, 1) sufficient clearance from the crown to the top of transducer is seen when the ram is at top dead center, 2) the slide bracket is no closer than 2" from the bottom of the transducer hex with the slide at its uppermost point, 3) that the linear transducer is as perpendicular to the press bed as possible and that brackets are aligned so as not to rub or side load the linear transducer when the slide is being adjusted, 4) that sufficient clearance for the linear transducer guide tube is provided when the slide is at its uppermost point.



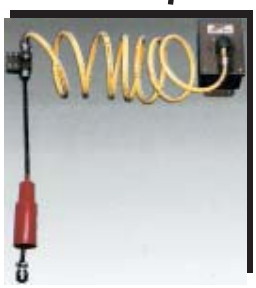


GEMCO manufacturers an optional Universal Tranducer Mounting Bracket to help simplify installations. (see picture below)

The cable termination kit should be installed such that the flexible cable between the linear transducer and the junctionbox is as closely aligned as possible and that the junctionbox has clearance when the ram is at its uppermost point.

Cable Termination Kit

Junction box mounts on crown of press. Coiled cable protects and controls cable connection to the linear transducer mounted on upper arm.



Universal Transducer Mounting Bracket Part # SDO441300

Simplifies mounting of linear displacement transducer between upper pitman arm and ram.

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High Resolution Resolver Transducers for Heavy Duty Industrial Applications

For over 30 years, **GEMCO's 1986 Resolver Transducers** have been a standard solution for harsh industrial applications such as steel mills and stamping press automation.

GEMCO has always been a pioneer in the design and manufacturing of "built to order" resolver packages. We can mechanically and electrically match any competitor's package while improving on the overall design to enhance the performance, accuracy or durability. Through our wide range of materials for construction and precision gear reducers we can extend your sensor's life many times over. We offer packages with multiple sensors and gear reducers in a variety of materials. We have engineered special resolver packages with stainless steel housings, oil filled packages, high RPM, high resolution, resolver/encoder combinations and tach generators.

The resolver technology used has no electronics in the transducer, allowing use in a wide range of temperature and vibration extremes.

1986 Resolvers

Din Rail Mount Module Allows Standard Resolvers DeviceNet Functionality

In many applications the harsh environment requires a rugged method of rotary positioning. Resolver technology is the proven method to obtain absolute rotary position data in the harshest environments such as steel mills, lumber and metal stamping. In areas of the plant where electronics cannot survive, but DeviceNet networks are used, we have the answer. The 1990DN mounts on a din rail in the control panel and a standard GEMCO resolver is wired to the terminals. The DeviceNet network is then attached to the front connector to pass position data, RPM, and set point status from the module.

The 1990DN plugs in as a node on any control system with a DeviceNet Scanner Card. Continuous rotary position data is provided with 12 Bit resolution. In addition, eight (8) built-in user programmable set points allow direct control of critical functions over the network. All programming is done over the DeviceNet network.

1990DN Resolver Interface/PLS

Special Resolver Assemblies

For applications requiring two electrically separate but redundant resolver signals, GEMCO offers a unique package that provides one resolver assembly with two internal resolvers tied to the main input shaft. The resolver outputs can be electrically the same or different from each other. We utilize a precision anti-backlash gear head with two resolvers driven at a 1:1 ratio with the main input shaft. Each resolver is then wired to a seven pin amphenol connector that matches the requirements of the interface device. The resolver would typically be connected to the crankshaft of the press and provide identical position feedback for two separate interface devices such as brake

monitoring, tonnage, signature analysis, PLC input, robotics, etc. We also provide resolver cables with the connectors wired to match the resolvers output and interface directly with other equipment. The resolvers listed below are for interfacing to Gemco, Autotech, AMCI and Modicon products. They are based upon our series 1986A foot mount resolver with a ¾" diameter input shaft, heavy duty input shaft bearing with rear and side mount connectors.

NOTE: GEMCO and Autotech use the same size 11 resolver and are wired identically. AMCI and Modicon use the same size 11 resolver and are wired identically.

PT# 1986-2075: Both resolvers are electrically compatible and wired for GEMCO or Autotech interface devices.

PT# 1986-2077: One resolver is electrically compatible and wired for Gemco or Autotech interface devices. The other resolver is electrically compatible and wired for AMCI or Modicon interface devices.

PT# 1986-2085: Both resolvers are electrically compatible and wired for AMCI or Modicon interface devices.

For proper resolver cable selection, consult our series 1986 Resolver Catalog.
***Consult factory for other resolver electrical outputs such as GE, Reliance, Namco, etc.

Replacing Competitor Resolvers

We offer the largest selection of resolvers for single and multi-turn applications in a variety of mounting configurations. We also offer the largest selection of direct bolt-in replacements for competitor resolver packages. Refer to our series 1986 Resolver catalog for full details on the following replacement resolvers.
NOTE: *Consult factory for specific competitor packages not listed.*

AUTOTECH REPLACEMENTS:
The GEMCO series 1986I is a direct bolt-in replacement for the Autotech series RL-100 in single turn and geared versions.

The GEMCO series 1986C flange mount resolver is a replacement for the Autotech series E6R and E7R in single turn and geared versions.

AMCI REPLACEMENTS:
The GEMCO series 1986F, 1986G, 1986GG and 1986H are all direct bolt-in replacements for the AMCI line of resolvers. Consult our Applications Engineering group for assistance in crossing over these units from AMCI to Gemco.

NAMCO REPLACEMENTS:
The GEMCO series 1986B and 1986C flange mount resolvers are replacements for Namco single turn and geared versions.

1986F

1986G

1986H

1986GG

1986I

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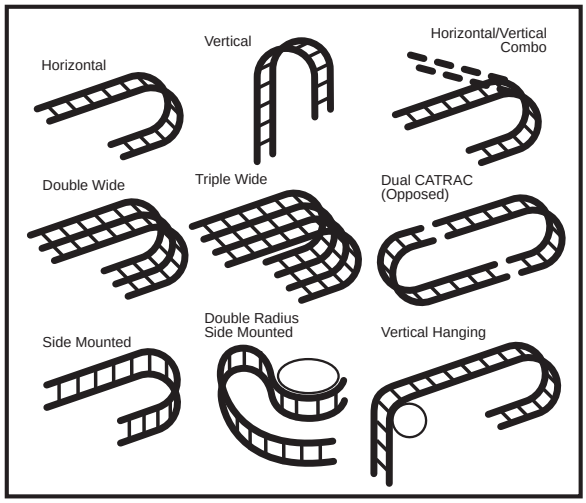
Get On The Right Track With Catrac Cable & Hose Carriers

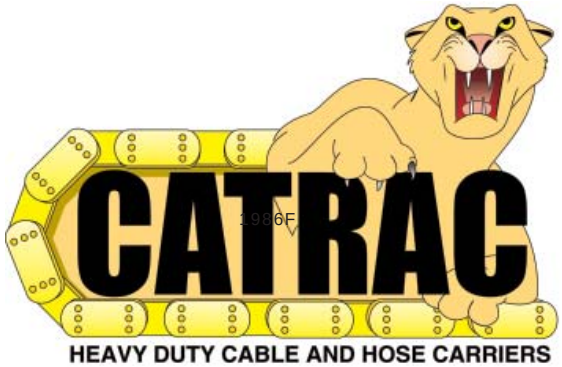
CATRAC is used on various types of machinery as a means of safely and efficiently conveying power, electrical, air, or fluid (or a combination of these) to equipment in motion. CATRAC is designed to be maintenance free and to protect cables and hoses from abrasion, wear, and twisting. A wide variety of options are available.

The center pivot design allows for smoother cycling and minimal hose movement. The CATRAC design offers “No Pinch Points” to insure operator safety. Standard side links are high tensile steel for maximum strength. Steel CATRACs are zinc plated with a yellow dichromate dip for superior corrosion resistance. Optional materials are available such as aluminum and stainless steel.

We also offer a line of Mill Duty CATRACs that are used in rugged applications and environments such as steel mills. These CATRACs offer a box beam type carrier for maximum strength and stability. Spring loaded rods offer the customer easy access to cables and hoses. They also eliminate the concern of fitting sizes that must pass through the (fixed) compartment opening on a box beam style carrier. Hardened shoulder bolts and locknuts (referred to as bolted construction) are recommended for use in rugged environments. The CATRAC is manufactured so that pieces or sections can be removed or replaced in the field.

Mounting Variations





Our CATRAC product offers: a variety of sizes from 2.00” to 14.00” high links, carrier options from welded carriers, split aluminum bar carriers, rod carriers, removable pipe, spring loaded rods, vertical pins, double deck, etc.; custom radius “M” dimension (including double radius); custom and special widths, including single widths, double widths, triple widths, etc.. We offer various support systems from a single stationary roller support to a complete CATRAC carriage support system.

We can provide you with the optimum system to suit your needs either with our standard carriers and options or by means of a custom designed system to meet your specific requirements. In addition to our standard systems used in a standard linear motion, we can also provide you with double radius side mounted systems. Contact our applications engineers for additional information or to discuss your needs in detail.

CATRAC Features

- No pinch points
- Center pivot design for minimal cable and hose wear
- Wide variety of standard carrier designs
- Available in any radius or width
- Custom designs available to optimize your system
- Superior finish and corrosion resistance
- J.I.T. programs
- Short lead times
- Designed and manufactured in the USA

GEMCO®

Rockwell Automation
Encompass™ Product Partner
Americas • Asia-Pacific

Other Products

B/W Controls™
LIQUID LEVEL TECHNOLOGY

GEMCO
INDUSTRIAL BRAKES

GEMCO
- LINEAR DISPLACEMENT TRANSDUCERS
- PLC INTERFACE PRODUCTS
- ROTARY POSITION PRODUCTS
- PROGRAMMABLE LIMIT SWITCHES
- EXTREME DUTY CABLE REEL PRODUCTS
- ROTARY LIMIT SWITCHES
- RESOLVERS
- MILL DUTY ENCLOSURES
- ULTRA HIGH SPEED PLS
- SAFETY PRODUCTS

CATRAC®
HEAVY DUTY CABLE AND HOSE CARRIERS

Made In America

AMETEK®
AUTOMATION & PROCESS TECHNOLOGIES

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