

SEPTEMBER 2023

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THE **LEADERS IN MANUFACTURING** ISSUE

*Bonus Issue*

**MH&L**

Material  
Handling  
& Logistics

**2023 TOP 10  
FORKLIFT  
MANUFACTURERS**

The Leading Edge of Manufacturing Innovation

# NED<sup>TM</sup>

## New Equipment Digest<sup>®</sup>

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and Crannies



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of the Future



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Dip Your Toe Into 3D Printing



# Quality Sensors at Sensible Prices

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- Zinc alloy or reinforced thermoplastic housing
- Wide offering of head actuators
- IP65 or IP66 protection rating
- 90-degree adjustable head

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- Wide variety of head actuators
- IP65 protection rating

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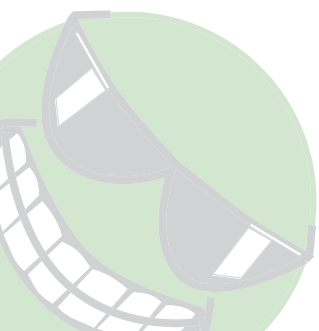


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**Laura Davis** | Editor-in-Chief  
(815) 348-9052 • LDavis@endeavorB2B.com

**Alexis Gajewski** | Senior Content Strategist  
(630) 454-7044 • AGajewski@endeavorB2B.com

**Thomas Wilk** | Group Editor  
(630) 454-7012 • TWilk@endeavorB2B.com

**Julie Whitty** | Art Director  
JWhitty@endeavorB2B.com



CEO | **Chris Ferrell**

President | **June Griffen**

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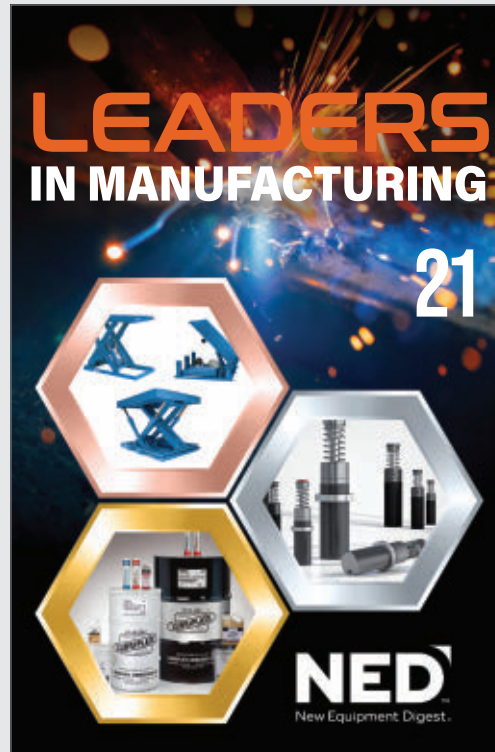
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**New Equipment Digest**  
2 Summit Park Drive, Suite 300  
Independence, OH 44131  
(234) 466-0200  
[www.newequipment.com](http://www.newequipment.com)

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## FROM THE COVER



## PRODUCT SPOTLIGHTS

p. 17

The Extech VPC260 6-Channel Particle Counter from Teledyne FLIR monitors indoor air quality to check for air pollutants including exhaust, smoke, dust, and more.



p. 19

KEEN's Camden work boot is designed to keep workers stable with a secure footing 90-deg. heel and a comfortable midsole for all-day comfort.



p. 20

Hyster Company's H40-70A series of lift trucks handle capacities up to 7,000 lb. (3,100 kg) and include a stability system that continuously monitors truck status for safety.



p. 30

Saint Gobain's Norton Vortex Rapid Prep Non-Woven Flap Discs use agglomerated aluminum oxide grain technology to enable the cutting power of a coarser grit while producing finer, smear-free finishes.



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**Unison Ltd.**

More online: [newequipment.com/21272785](http://newequipment.com/21272785)

### Computer Powers 4 HD Monitors

A unique computing solution that uses 802.3bt PoE++ technology, the **Thinlabs PoE NUC** allows for up to 4 HD displays to be fully powered over a single Ethernet cable. It enables a seamless supply of up to 90 W of power through a standard Cat 6 Ethernet cable to simplify deployment, eliminating the need for an electrician to install an electrical outlet wherever the PC and monitors are required. Instead, a single Ethernet cable up to 328 ft (100 m) in length can be used to provide data and power to the complete system.



Thinlabs

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### Portable Fan Keeps Spaces Dry

The **Delta BreezAirMover AMR1200** is a powerful, quiet, and energy-saving air mover to keep your spaces dry, comfortable, and well-ventilated. It features a high-efficiency brushless DC motor, delivers up to 1,200 CFM of airflow, and has a low sound of 55 dB-A at high speeds. The digital control panel with LED display controls the power, its 3 available speeds, a timer function/display, and has a continuous time counter for up to 99 hours.



**Delta Electronics**

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### Servo Drive Package

Optimized and efficient, the **SINAMICS S200 servo drive** with a SIMOTICS S-1FL2 servo motor and motion connect cables has a power range of 0.1 to 7 kW and various communication options such as PROFINET IRT and pulse train. Features include an integrated brake resistor and integrated holding brake control, coated circuit boards (3C2) in the S200 and IP65 motors with metal connection solution, and built-in under-voltage protection.



**Siemens Digital Industries (DI)**

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### Internet-Free Communication App for Job Sites

Mobile app **ConneX CREW** is a group communication app that connects up to 10 team members without needing internet or cell service. The app requires one Audio Gateway which acts as a portable network to connect teams using their smartphones without any other equipment. Users can activate the hands-free feature when using the speakerphone or pairing with any Bluetooth hearing device. The mobile app can be downloaded for free from the Google Play or Apple App stores.

**The David Clark Company**

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### 2-Way Solenoid Valve

Manufactured in an all-brass form, the **Series 6700 solenoid valve** provides a superior flow rate for typical applications of 2-way control of inert gasses, water, and compatible fluids. The diaphragm valve comes in both 0.75 and 1-in. NPT port configurations with FKM seals. At 120 psi, the 6700 delivers a flow rate of 53 GPM.

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With the **P400HPR compressor**, users can achieve pressures of up to 250 psig with 3 compression stages, all within the P400 power range. Its aero design ensures peak performance and delivers substantial energy savings compared to conventional dry screw or oil-injected screw compressors. The P400HPR is an ideal fit for HOC drying applications. Meeting ISO 8573-1, the 100% oil-free compressed air guarantees no oil transfer in the air stream.

**FS Elliot**

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## Machine Vision Lights

*allow the attachment of polarizers*

Where built-in machine vision illumination is not enough, the **Lightgistics series**, available in ring and linear formats, offers direct connection and control through a camera's trigger output. The lights feature an integrated cable that connects to the camera, light, and controller reaching up to 49 ft (15 m), and can work with almost any camera.

**Smart Vision Lights**

More online: [newequipment.com/21272771](https://newequipment.com/21272771)



## Drive System Speeds Up Productivity

*changes transport speeds and cart direction*

**CartPilot** is a powered-drive system that can be added to nearly any material-handling cart to boost facility productivity by upwards of 10% or more. It features easy-to-use controls and a battery-powered motor that allows a single operator to move up to 1,000 lb. (454 kg) of materials. Safety features include reverse object detection, safety beams, reverse backup horn, and zero-turn maneuverability.

**Cannon Equipment**

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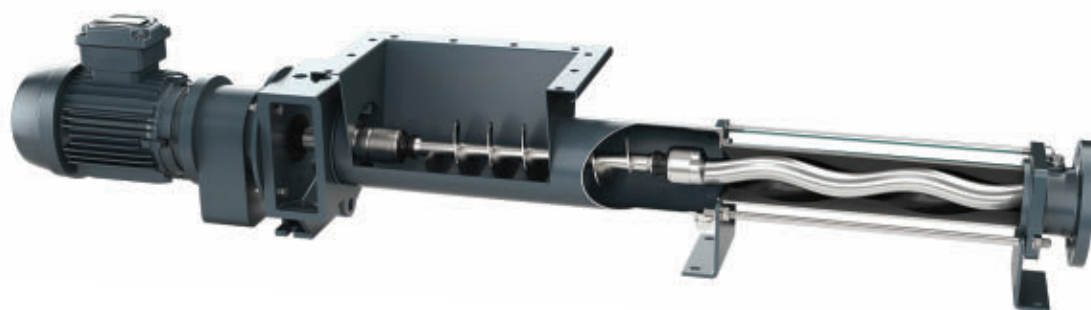
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The **NEMO BO Open Hopper Progressing Cavity Pump** for viscous to non-free-flowing product with and without solids works for applications in the beverage, food, cosmetic, biotech, and chemical industries. The pumps provide continuous, pressure-stable, gentle, and low-pulsation pumping of a wide variety of media. Since the shape of the cavities is always constant, the pumped product is not compressed. NEMO pumps can therefore convey not only fluids but also solids.

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# VIBRATION SOLUTIONS VITALIZE EQUIPMENT HEALTH

By Sheila Kennedy, CMRP

Industrial assets benefit from proactive condition management. Vibration monitoring and analysis are prominent predictive maintenance strategies, and vibration damping is a foundational vibration control strategy. Solutions that deliver on these strategies help plants detect or prevent irregularities, avert costly failure and downtime, and increase reliability and efficiency.

## Monitoring Technologies

Vibration monitoring of rotating equipment reveals issues before they create problems. The new **SM series accelerometer from Wilcoxon Sensing Technologies** is a side-exit vibration sensor. Its integral cable and optional armor remove the need to install a separate cable assembly and protect the sensor and cable in wet and aggressive plant environments.



**SM series accelerometer from Wilcoxon Sensing Technologies.**  
Wilcoxon Sensing Technologies

The SM series solves accelerometer installation challenges in low clearance applications, “but it is not just compact,” states Tom LaRocque, director of product and product management at Wilcoxon Sensing Technologies. “A novel pivoting mounting base replaced the through-bolt that most side-exit sensors use, which eliminated the overhead clearance that was needed to tighten the sensor into place. The pivoting base makes it easy to install in any orientation as well.”

The **Airius II LTE-M wireless vibration sensor from SPM Instrument** is now globally available. Airius series sensors include Wi-Fi and LTE-M versions that run on battery or external power. The MEMS-type sensors with digital output measure triaxial vibration and temperature.

“Airius LTE-M complements our existing product portfolio and Condmaster ecosystem, allowing condition monitoring on equipment where traditional Wi-Fi networks are unavailable, such as



**SPM Instrument's Airius II LTE-M wireless vibration sensor.**  
SPM Instrument

remote locations or rooftops,” says Ron Kittle, managing director of SPM Instrument. To overcome the challenge of operating on customer networks due to security risks, Airius LTE-M “operates via a completely independent and secure cellular connection independent from the customer’s network,” he adds.

**Versatilis Transmitter** is a wireless multivariable instrument from **Honeywell** that measures vibration, acoustics, and surface and ambient temperature of rotating equipment to uncover anomalies. To ease vibration analysis, it converts time domain data to frequency domain data through Fast Fourier Transforms (FFT) on the edge.

**Honeywell's Versatilis Transmitters.**  
Honeywell Process Solutions



The new transmitter is part of the broader Honeywell Versatilis solution suite. “Versatilis is unique in its focus on interoperability, edge analytics, and long battery life,” says Achal Nath, seniordirector of offering management at Honeywell Process Solutions. “Interoperability is ensured through close adherence to open protocols and cyber security standards.”

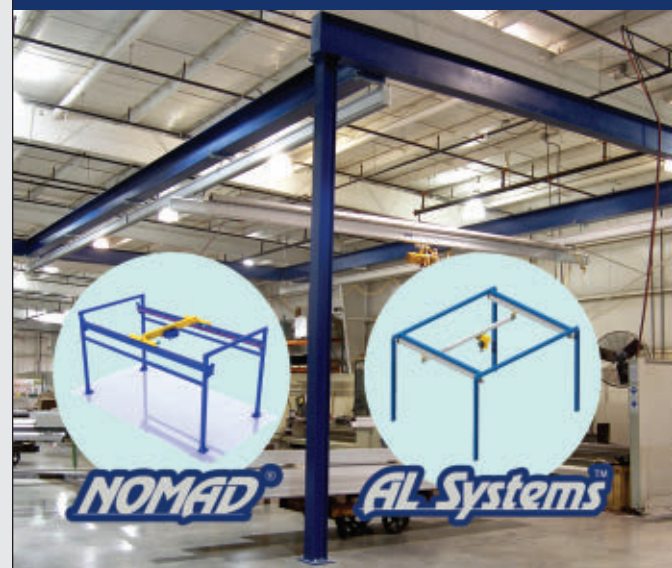
## Analysis Facilitators

Analysis turns data into actionable information. The **NEST i4.0 vibration analysis solution from Acoem** is a predictive maintenance platform developed to solve common challenges of having plant condition monitoring programs segmented across multiple software solutions. Its newest module,

**Acoem's NEST i4.0 vibration analysis solution.**  
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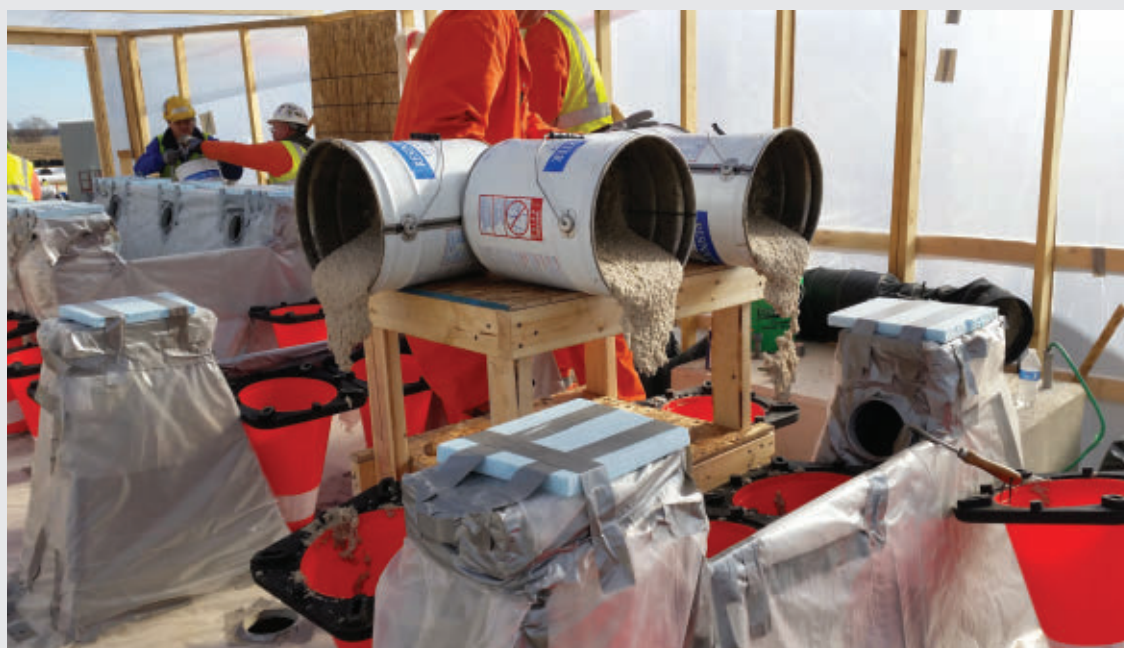


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RDI's Modal Amplified system.  
RDI Technologies

WebPortal, enables centralized supervision of all monitored rotating assets and every Acoem instrument, across multiple plant sites.

NEST i4.0 "pools portable, wireless, and continuous data in the same place, while leveraging AI, process information, and edge computing to focus analysis efforts on meaningful data," explains John Waldron, condition monitoring product manager at Acoem. "Centralization allows an application's criticality, complexity, failure modes,

and accessibility to dictate the means and frequency of data collection, instead of the other way around."

The new **Modal Amplified system from RDI Technologies** performs modal analysis calculations and then uses RDI's Motion Amplification camera technology to filter video to the vibration, visualizing the results that are found. "The entire field of view is measured, ensuring that no critical areas of interest will be missed, while also identifying unsuspected areas of concern that may have been undetected with traditional modal analysis methods," says Scott Burkhardt, director of services.

He notes that Modal Amplified makes what used to be a very time-consuming,

complicated, and costly process into a quick, comprehensive, easy, and economical modal analysis solution. It delivers instant results showing mode shapes of a real image, which makes findings very easy to analyze and communicate.

## Foundational Approach

Controlling vibration at the machine's foundation promotes equipment health. The **Escoweld vibration damping solution from ITW Performance Polymers** provides proper support for operating equipment. When coupled with a suitable anchoring system, Escoweld epoxy machinery grout delivers vibration-damping support while keeping precise alignment.

"Grouting equipment precisely in one day is necessary for our customers. In addition, filling the cavity with Escoweld can reduce vibration readings on average by one-third," says Michelle Jordan, operations manager at TECHMAR, an ITW distributor. "With the addition of modifying the aggregate load to the lift height, it can pour (or pump) anywhere from two inches up to 48 inches in a single lift. Rebar is almost never needed for these various heights." **NED**

Technology Toolbox is a monthly feature by Sheila Kennedy, CMRP, that appears in our sister publication *Plant Services*. Email [sheila@addcomm.com](mailto:sheila@addcomm.com) with products for consideration. The full Tech Toolbox library is available at: [www.plantservices.com/voices/technology-toolbox](http://www.plantservices.com/voices/technology-toolbox).



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TOP 10

Forklift Manufacturers of 2023

MH&L reveals the 10 largest global manufacturers of lift trucks, ranked by sales. p. 8



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4 Ways Generative AI Will Impact the Supply Chain  
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Closing the Gaps in Your Safety Training Program  
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Is Forklift Charging a Downtime Event?  
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# Top 10 Forklift Manufacturers of 2023

*MH&L reveals the 10 largest global manufacturers of lift trucks, ranked by sales.*

By Dave Blanchard

**T**ime again to report on the state of the global forklift industry, and by all indications, things were quite good indeed in 2022. In the United States, for instance, sales for forklifts in 2022 were the second highest on record, down just 1% from the previous year's all-time high.

According to the Industrial Truck Association (ITA), sales of forklifts in North America in 2022 totaled 344,330, compared to the all-time high of 347,677 reached in 2021. As you'll see in the financial reports given below, many of the global forklift producers also enjoyed robust sales in 2022, with many of the Top 10 achieving double-digit growth.

Due to inflation and hints of a possible recession, the forklift industry is currently down from the record highs we've seen in 2021-2022, with the North American market down nearly 32% year-over-year through the first quarter of 2023. "Many economists are predicting stagnant levels of growth in GDP for 2023," explains Brian Feehan, president of the ITA. "Ultimately, we will have to wait and see how the forklift market fares during the year given the predicted economic challenges facing the country. It is important to recognize that in 2022 and 2021, more than 100,000 units sold above the traditional North American annual market volume."

Following is MH&L's annual ranking of the 10 largest global manufacturers of forklifts, ranked by revenue. The ranking includes electric rider trucks (Class 1 and Class 2), motorized hand trucks (Class 3), and internal combustion powered trucks (Class 4 and Class 5). These companies provide some of the leading material handling technologies and vehicles used worldwide by companies to manage their warehouses and distribution centers, and many of them are at the forefront of developing and promoting the latest in forklift safety technologies. All financial figures are stated in U.S. dollars, based on the relevant exchange rate as of December 31, 2022. The information was provided by the companies, unless otherwise noted.



Toyota side-entry end rider

## 1. TOYOTA INDUSTRIES

Toyota Industries Corp., based in Kariya, Aichi, Japan, manufactures forklifts sold under the Toyota and Raymond brands, as well as other products. The company's revenues solely from the material handling/forklift market in 2022 were \$19.83 billion, which according to Toyota represents a sizable increase of 28% over the previous year. Toyota continues its long-standing position as the world's biggest forklift manufacturer.



STILL electric forklift

## 2. THE KION GROUP

The KION Group, based in Frankfurt, Germany, is made up of several lift truck brands, including Linde, STILL, Baoli, Fenwick and OM Voltas, as well as a Supply Chain Solutions segment under the Dematic brand. KION's Industrial Trucks & Services segment had revenues of \$7.89 billion in 2022. That represents a gain of 13% from the previous year.

**Dave Blanchard** is editor-in-chief of *Material Handling & Logistics*.





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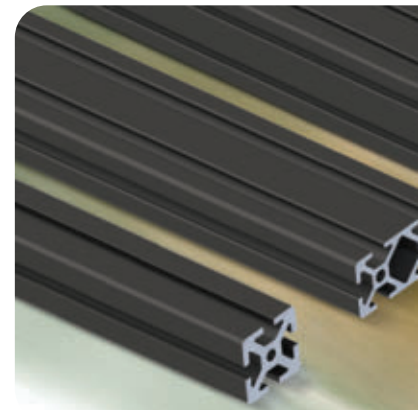


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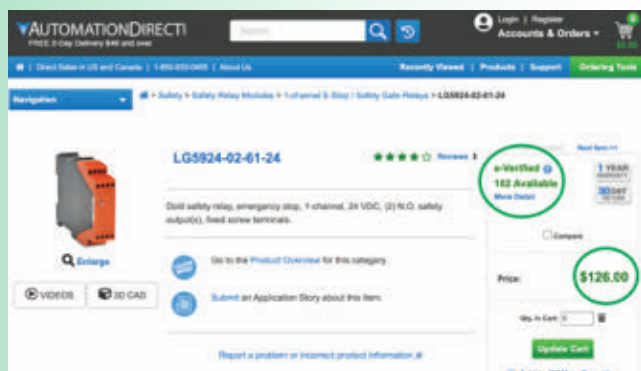
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3. MITSUBISHI LOGISNEXT

Mitsubishi Logisnext Co. Ltd., based in Tokyo, Japan, is a company created through the integration and consolidation of several global brands, including UniCarriers, Mitsubishi Caterpillar, Nichiyu, Rocla and TCM. Mitsubishi Logisnext had revenues in 2022 of \$5.35 billion, a significant improvement of 32% over 2021 sales, which catapulted the company from fifth to third place in this year's rankings.



UniCarriers IC diesel pneumatic forklift

7. MANITOU GROUP

Manitou Group, based in Ancenis, France, moves two notches up in the rankings thanks to a 26% gain in revenues in 2022: \$2.68 billion vs. \$2.13 billion in 2021.



Manitou LPG forklift

8. ANHUI HELI

Anhui Heli Co. Ltd., based in Hefei, China, had revenues of \$2.46 billion in 2022, a slight increase of 2% from \$2.41 billion in 2021 (according to Yahoo Finance).



Heli LPG pneumatic forklift

4. THE JUNGHEINRICH GROUP

The Jungheinrich Group, based in Hamburg, Germany, had revenues of \$5.11 billion for fiscal year 2022. That represents a 12% increase from the previous year.



Jungheinrich electric four-wheel counterbalance forklift

9. HANGCHA GROUP

Hangcha Group, based in Hangzhou, China, had revenues of \$2.14 billion in 2022, down 5% from the company's revenues of \$2.25 billion in 2021.



Hangcha electric lithium-ion forklift

5. CROWN EQUIPMENT

Crown Equipment Corp., a privately-held company based in New Bremen, Ohio, had revenues of \$4.69 billion in 2022, a 17% increase from 2021 revenues of \$4.01 billion.



Crown electric counterbalance forklift

10. KOMATSU

Komatsu Ltd., based in Tokyo, Japan, had revenues of \$28.64 billion for its construction, mining and utility equipment division, which includes forklifts, which represents a significant increase of 28% from the previous year. According to Statista, Komatsu's forklift business accounts for roughly 6% of sales for the division, which would put Komatsu's forklift business at roughly \$1.72 billion.



Komatsu IC pneumatic forklift

6. HYSTER-YALE MATERIALS HANDLING

Hyster-Yale Materials Handling Inc., based in Cleveland, Ohio, the parent company of the Hyster and Yale brands of lift trucks, had consolidated revenues of \$3.5 billion for fiscal year 2022, a 15% increase from the \$3.1 billion reported in the previous year.



Yale lithium-ion counterbalance forklift

HONORABLE MENTION: CLARK MATERIAL HANDLING

Although finishing outside of the global Top 10, Clark Material Handling, based in Lexington, Ky., is one of the largest US-based forklift manufacturers. The privately-held company, which has been a supplier of forklifts for over 100 years, had annual revenues in 2022 of \$908 million, up 12% from \$812 million in 2021. ■



Clark electric four-wheel forklift



# 4 Ways Generative AI Will Impact the Supply Chain

*Stronger operational efficiency and predictive maintenance are a couple of the benefits of AI.*

By Dan Giangliulo

**L**ogistics companies have faced persistent supply chain issues since the start of the pandemic. And nearly 60% of logistics managers are not expecting conditions to return to normal until at least 2024 – if at all.

While many of the root causes (like the war in Ukraine) are beyond control, leaders have focused on resolving issues they can control. The problem? The technology hasn't been there. That is until generative AI burst onto the scene.

With this technology, users can interact via conversational chatbots or microphone-enabled headsets. And behind the scenes, AI uses technology like large language models and

natural language interfaces to output text and audio that's sophisticated, personalized, and easy to understand.

Generative AI is still an emerging technology. But it promises to impact almost every aspect of the supply chain, from operational efficiency to maintenance timelines.

Let's look at four of the most exciting applications.

## 1. AI-Powered Voice Picking

Imagine a worker who's tasked with picking a batch of customer orders for shipping. They go to a specific rack for a specific type of item, but there isn't enough inventory in that location. So they ping their supervisor for an alternative place to look.

Except the supervisor is busy helping someone else with a forklift or pallet jack. The worker can't get the instructions they need, which means they can't load up all the orders before the last delivery trucks go out. What customers experience in the end is: shipping delays and plenty of frustration.

Enter AI-powered voice picking. This technology uses a natural language interface to communicate with workers via audio. Workers can ask conversational questions using a headset microphone. On the back end, generative AI can analyze a warehouse's enterprise resource planning (ERP) software to give data-informed answers.

Voice picking already exists, but current technology relies on area confirmation codes and command-based language. The resulting interactions often feel stilted, and it can take a while for workers to adjust.

Generative AI improves on this technology by enabling more conversational interactions. What's more, it can even translate audio inputs and outputs based on employees' language preferences. That's huge for warehouses that employ workers with English as a second language.

What does AI-powered voice picking look like in practice? In our earlier scenario, a worker can ask questions out loud like: "Where else do we have Product A in stock?" In seconds, the AI can communicate the right warehouse

section, aisle, and rack – all without the need to wait for a supervisor. And if the worker speaks limited English, they can receive instructions in the language they prefer.

The takeaway: with AI-powered voice picking, logistics leaders can speed up the order-picking process.

## 2. Predictive Maintenance

Equipment failures are incredibly costly for logistics companies. If a conveyor system malfunctions or a few electric pallet jacks break down, operations can quickly grind to a halt. And if there's a part shortage, it could take a while to complete repairs in order to return to normal operations. The downstream impact: slower order fulfillment times.

With generative AI tools, though, logistics leaders can receive real-time guidance about equipment maintenance.

For instance, if an operations manager wants to know the status of their conveyor systems on a given day, they can query a generative AI chatbot, which will process data from equipment monitoring sensors on every conveyor system.

From here, the AI can generate...

- A table displaying the percent of operational conveyor systems in each warehouse zone.
- A chart that slots the conveyor systems into "green," "yellow," or "red" maintenance categories.
- Recommendations for how to fit maintenance within existing operations (e.g., making repairs on weekends or after peak weekday hours).

If the manager wants to order repairs, they can ask the AI questions like "How long will it take to repair Conveyor System A?" or "What parts will we need to complete repairs?" Then, AI can generate a predicted repair timeline or a list of required parts. It can even access external supply chain data to identify part shortages that might impact the time to repair.

Generative AI can help logistics leaders prevent equipment failures before they occur. This way, it's easier to avoid operational bottlenecks that ripple throughout the supply chain.



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### 3. Simple Workplace Safety Management

Worker safety is an increasingly serious challenge for logistics leaders. From 2011 to 2021, fatal work-related injuries increased by 30% and nonfatal injuries by nearly 40%.

From a human perspective, there's a clear need to create safer working conditions for logistics teams. But there's also an efficiency factor to consider. Each work-related injury keeps workers away for weeks, if not months. That's something logistics companies can't afford amid an ongoing labor shortage.

Here's where generative AI can help. Leaders can outfit their warehouses with AI-powered computer vision cameras that continuously monitor an area for safety hazards (say, if a worker is too close to heavy machinery or dangerous chemicals). Then, the AI can push alerts to workers via a smartphone app or industrial-grade wearable.

In the back office, an operations manager can use a generative AI chatbot to learn more about safety problems on the ground. For instance, they might ask, "What are the top five safety issues we're facing today?" Then, the AI can pull from camera data to list the specific problems on the warehouse floor – and use historical data to contextualize current problems within long-term trends.

Generative AI can also support leaders during the workplace safety training process. For example, when building out weekly toolbox talk topics, a floor supervisor might ask

an AI chatbot to list eight topics that tie directly to real-time safety needs. And if a cohort of new employees needs to complete a series of digital safety training modules, an AI chatbot can respond to user questions as they come up.

The bottom line? With AI technology, logistics leaders can more easily keep workers safe and reduce injury-related downtime.

### 4. Stronger Operational Efficiency

Operations managers oversee product inflow, outflow, and movement throughout a warehouse. But with persistent supply chain issues and mounting customer frustration, there's more pressure than ever to maintain efficient operations.

Generative AI can relieve some of this pressure by functioning as a personal operations copilot. For instance, an AI chatbot can communicate with managers about...

- **Product movement trends.** AI can flag whether there are frequent bottlenecks, say, in the loading or packing zone.
- **Product heatmaps.** AI can create heatmaps that display whether certain racks are being over- or under-picked.
- **Broader supply chain disruptions.** AI can continuously monitor news outlets and communications channels for real-time information about disruptions. Then, it can suggest email language to notify custom-

ers about how their orders might be impacted.

One of the coolest parts? Generative AI can learn from every interaction to make increasingly helpful recommendations. Over time, this can have a huge impact on operational efficiency.

### To Rightsize the Supply Chain, Think Beyond "Normal"

It might be a while before the supply chain returns to normal. But "normal" shouldn't be the goal.

"Normal" in 2020 wasn't enough to combat COVID-related workforce cuts. And "normal" in 2022 couldn't keep up with the spiraling supply chain crisis out of Ukraine.

It's time to think beyond returning to normal – and invest in emerging technologies that can help logistics companies achieve unforeseen levels of efficiency, productivity, and safety.

Generative AI can be a part of that solution. But don't stop there. Look for ways to integrate cutting-edge sensors, mobile software, and connected wearables throughout your operations. The end goal: a smart supply chain that can weather any crisis. ■

**Dan Giangiuolo** is senior director, solution delivery at Nexer Enterprise Applications, part of the Nexer Group, which provides ERP, data analytics, Internet of Things (IoT), and artificial intelligence (AI) expertise.



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# Closing the Gaps in Your Safety Training Program

*Asking these eight questions of your training program can help you identify gaps in your training that need to be addressed.*

By Stephanie Kovach

A fragmented and inconsistent approach to safety is inadequate when applied to today’s dynamic, fast-moving work environments. The result can include increased risk to employees, disruptions in operations, damaged equipment and exposure to compliance issues.

Implementing an integrated and individualized approach to a safety training plan can help bring a consistent focus to safety management. It also stresses the important role everyone plays in creating and maintaining a safe work environment.

A robust training program is a vital component of an integrated and individualized approach to safety. It needs to be a program designed to do more than simply check a box on a safety checklist. The effectiveness of a forklift safety

training program can vary significantly depending on how it is delivered and who within the organization is receiving it.

Effective safety management requires extending training beyond forklift operators to include managers, supervisors and pedestrians, and making it readily accessible and convenient for everyone involved. By focusing on both comprehensive classroom and hands-on training, training programs have the potential to encourage meaningful behavior changes that can enhance warehouse safety and form the foundation for a strong safety culture.

Additionally, taking a top-down approach to forklift safety training is an effective method to increase organizational buy-in and effectiveness while helping to communicate the importance of a comprehensive and integrated approach to safety.



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Organizations need to continually evaluate safety programs to minimize gaps in training, as well as to ensure that everyone has an understanding of the role they play in your organization's safety culture.

To identify gaps in your training, you can evaluate your current program by asking the following questions:

### 1. How effective is the training you are delivering?

Relying too much on classroom training and not providing hands-on training can limit the ability of operators to translate learning into practice. The classroom can provide the foundation, but new skills are best internalized when operators can get on a forklift and apply their new knowledge under the supervision of an experienced trainer. A fleet and operator management system can support training effectiveness and evaluations and help identify improvement opportunities.

### 2. What is the frequency of your safety training?

Like any form of education, the positive effects of safety training can erode over time. In the United States, OSHA states that training is required every three years, at a minimum, but more frequent refreshers can have positive effects. Establish a frequency for operator refresher courses and maintain discipline in ensuring established guidelines are followed. As much as possible, integrate regular training into your operations, leveraging online learning systems that allow operators and supervisors to regularly refresh their knowledge at their own pace with minimal disruption to operations.

### 3. Are new operators receiving training in a timely manner?

In today's fluid job market, you will inevitably see some transition in your team of operators. It is essential to have a process to ensure new employees receive the training they

need early in onboarding. Some forklift telematics systems can provide real-time feedback to operators that reinforces correct behavior and recognizes incorrect behavior. They can also give supervisors the performance data they need to showcase exemplary operators and their good choices while also identifying areas for additional training.

### 4. Are supervisors trained to identify and address incorrect operating practices?

Positive reinforcement by supervisors can be one of the most effective methods for sustaining safety improvements initiated by formal training programs. However, supervisors must be appropriately trained to spot incorrect behavior and deliver positive and constructive feedback in a way that creates long-term behavioral changes.

### 5. Are non-operators trained to work safely around forklifts?

Forklift operators are not the only ones who could be involved in forklift-related accidents. Distracted or inattentive pedestrians can also put themselves in harm's way. A comprehensive approach to training should include those team members who work around but do not operate forklifts. This training helps pedestrians better understand the "do's and don'ts" of working in environments where forklifts are present.

### 6. How is training being used to support the introduction of new technology?

As you introduce new technologies into your operations, training plays a key role in accelerating adoption and addressing safety considerations associated with the new technology. Training may even help realize the benefits associated with the new technology. Listening and collaborating with front-line workers can help determine if additional adjustments to training programs regarding the new technology are required.

### 7. How is new technology being used to support your training?

Several operator-assist technologies are available on today's forklifts that can work passively or actively to reinforce training and guide operators to employ best practices consistently. Advanced sensors and software can adjust forklift performance parameters based on the load, task, location and environment to promote safe, productive operations. For instance, a system that uses Lidar sensors installed on the lift truck that scan for objects, pedestrians and other forklifts to alert the operator of their presence and actively slow the vehicle.

### 8. Do you have the resources and expertise to manage training in-house effectively?

Effective training requires a high degree of expertise in equipment operating practices and how people learn—in addition to the time to plan, execute and manage training programs. Even the best designed training programs can be derailed or lose effectiveness if internal resources don't have the expertise, up-to-date knowledge and time to prioritize it.

Training is a fundamental element of the safety equation and is vital to building and maintaining a strong safety culture. Asking these eight questions of your training program can help you identify gaps in your training that need to be addressed to help leverage your investment in safety and implement a successful safety program. ■

**Stephanie Kovach** is director of training with forklift manufacturer Crown Equipment.

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# Is Forklift Charging a Downtime Event?

By TJ Shelters

**W**e've all been in a situation on a long road trip where we've pushed the gas gauge to the max and rushed to the gas station. Our expectation is that in a manner of minutes, we will be refueled and back on the road heading back towards our final destination. But imagine if when you got to the fuel pump, it was refueling at a painstakingly slow rate. Instead of a couple of minutes you had to wait 15-60 minutes for your tank to be replenished. Your kids would be whining, your significant other would be upset, and you would likely be extremely frustrated. You would also look at the GPS after the tank was full and realize the lost productivity in your trip immediately.

This seems like an unfathomable scenario as we wouldn't tolerate waiting additional time for our personal vehicle to refuel.

Yet, among those of us who lead and manage manufacturing and distribution sites, waiting for a forklift to refuel is a common and expected occurrence. We're accustomed

to that wait time when it comes to powering our forklifts—after all, that's just how forklift power works. Right?

In my years spent working with hundreds of professionals in manufacturing, distribution, operations, and facility maintenance, I've met very few who understand (let alone adopt) the principles of efficient forklift power management. Those that "get it" understand that time is money, and the minutes that tick by as they recharge their invaluable forklifts can be counted in hundreds of thousands of dollars over the life of the forklift.

The question I would like to pose is, should we view forklift charging as a downtime event? I would suggest it's high time this industry started examining and troubleshooting this downtime with the same haste and ingenuity we bring to every other obstacle causing operational inefficiency. It's this simple—powering your forklift is a downtime event.

After all, just look at the landscape today. We're spending countless sums of money on

automation, advanced equipment, specialized training and high tech solutions—all in the name of increased throughput. Because we understand that increased throughput directly correlates to increased profits and a competitive advantage. The more quickly and consistently you can be up and running at full steam, the more your team and organization will ultimately benefit as a result.

We understand these concepts when it comes to so many contributors to downtime, yet we're still plugging in our forklift batteries and waiting untold amounts of time for them to be charged and functional again. We don't evaluate and assess options around our forklift power, we don't test new solutions to determine whether charging time is reduced—we simply take it for granted that our forklift batteries have to be charged

when they have to be charged, and they take the time they take to do so.

Forklift manufacturers might go to great lengths to disprove this, but in my experience (and supported by the experiences of many experienced colleagues in the industry), all forklifts—no matter the make, model and cost—perform in essentially the same way, at close to the same level of efficiency.

But the same definitely can't be said of forklift power sources and solutions.

There is now an entire industry devoted to forklift power, with emergent solutions cropping up every day. Best practice leaders in our field are now developing detailed energy security plans with nuanced approaches to powering their critical equipment. They're working with expert partners who work exclusively in the field of equipment power and have their finger on the pulse of emerging trends. And they're getting smart and crafty about putting back-up power solutions in place for downtime periods.

If exploring and activating that emerging technology meant you could cut your forklift charging time (aka downtime) in half, what might that mean for your day-to-day operational milestones? How might your numbers improve as a result?

More and more I see folks in our industry looking at their facilities, operations and equipment differently. We all want to find novel, game-changing ways to meet our targets and deliver on our promises. We all want more. And I for one fully support this spirit of ingenuity, innovation and enthusiasm sweeping across our spaces. But it's time we bring that same kind of thinking and energy to our tried-and-true methods for powering our commonly used equipment. Our forklifts are absolutely integral to the work we do—we have to start thinking of their power in the same way. ■

**TJ Shelters** is national vice president of sales at Concentric, a provider of DC power management and on-site maintenance for the material handling and critical power industries.



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FROM THE COVER

**Autonomous Welding Robot**  
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**MR4Weld** is an innovative, outdoor automation solution that improves quality, performance, and well-being during welding activities, primarily for shipbuilding.

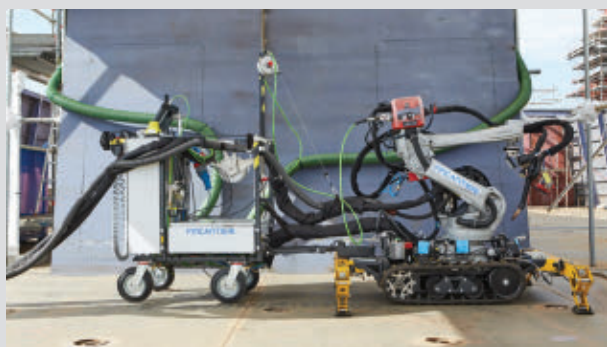
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Either sander works effectively on metal, plastic, fiberglass, wood, and other materials.

**Ingersoll Rand, Inc.**



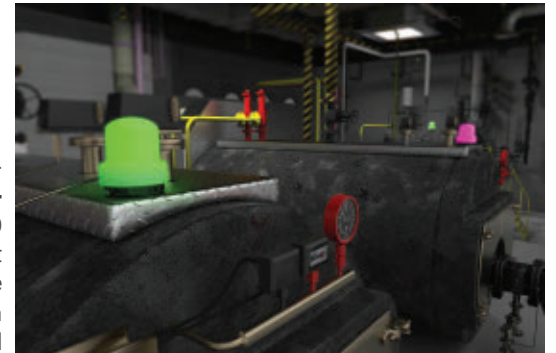
More online: [newequipment.com/21272792](http://newequipment.com/21272792)

## Multicolor Beacons Offer Unique Animations

*let users configure their preferred type of indication*

For advanced indication applications, the **K100 Pro Beacon series** has two 4 in. (100 mm) models: Pro Daylight Visible and Pro Indicator. The Pro Daylight Visible beacon offers 12 audible options and has a clear lens that avoids false indications, even in sunlight. Featuring 14 color options, the Pro Indicator beacon is programmable using Banner's free Pro Editor Software. Animations include options such as flash, rotate, and strobe.

**Banner Engineering**



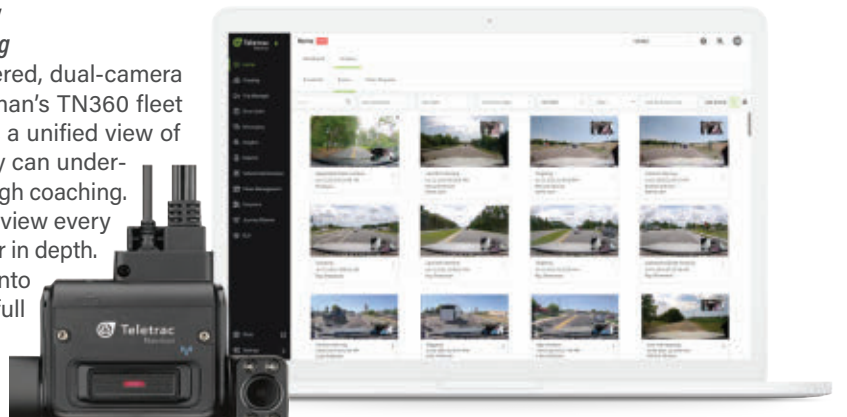
More online: [newequipment.com/21272753](http://newequipment.com/21272753)

## AI Camera Improves Fleet Safety

*provides driver assistance and status monitoring*

Teletac Navman's **IQ Camera**, an AI-powered, dual-camera dash cam is integrated with Teletac Navman's TN360 fleet management software to give fleet owners a unified view of their video and telematics data so that they can understand events and improve driver safety through coaching. The camera uses sensors and AI video to review every minute of drive time and understand behavior in depth. The camera pulls driver performance data into a single location, giving fleet managers a full view of performance so that they can implement reward programs and identify areas for improvement.

**Teletac Navman**



More online: [newequipment.com/21272833](http://newequipment.com/21272833)



### Handheld 6-Channel Particle Counter

*includes a start delay feature to set and forget*

The lightweight and ergonomic **Ex-tech VPC260 6-Channel Particle Counter** was designed for convenient indoor air quality monitoring in buildings. This meter accurately measures and displays up to 6 channels of particle sizes (down to 0.3  $\mu\text{m}$ ), air temperature, relative humidity, dew point, and wet bulb, helping technicians to identify hazardous conditions and ensure a safer environment. With the VPC260, technicians can check for harmful air pollutants such as exhaust, smoke, respirable crystalline silica dust (RCS), and airborne combustible dust once particles are detected.

**Teledyne FLIR**

More online: [newequipment.com/21272808](http://newequipment.com/21272808)



### Victor-Style Cutting Torches

*cut materials up to 12-in. (305 mm) thick*

The line of **V-Series 62-5 straight hand-held cutting torches** now includes options with equal pressure mixers. The V-Series delivers the performance and quality of the Harris 62-5 while also offering the benefit of using the Victor-style conical tips that customers may already have in stock. For demanding environments, the series includes torches for most fuel gases or alternate fuels. They are all equipped with FlashGuard check valves that prevent the reverse flow of gases for added safety.

**Harris Products Group**

More online: [newequipment.com/21272860](http://newequipment.com/21272860)



### Extreme Grip Slip Joint Pliers

*stay parallel, increasing surface area contact*

**Talon Grip Long Nose Slip Joint Pliers** have a diamond-serrated jaw to grip small items with a 57% increase in pulling power. The longer contoured cushion grip handle increases comfort, control, and leverage while requiring less hand pressure, mitigating hand fatigue.

**Snap-on Industrial**

More online: [newequipment.com/21272769](http://newequipment.com/21272769)

### Programmable Temperature Transmitters

*offer several mounting options*

**ProSense XTD2 and XTH2** series programmable temperature transmitters are ideal for a range of applications and can be used with a variety of sensors and process inputs. They provide a linearized 2-wire current loop output that can be configured for 4 to 20 mA or 20 to 4 mA using the free ProSense field device configuration software and an XT-USB cable (purchased separately).

**AutomationDirect**

More online: [newequipment.com/21272800](http://newequipment.com/21272800)



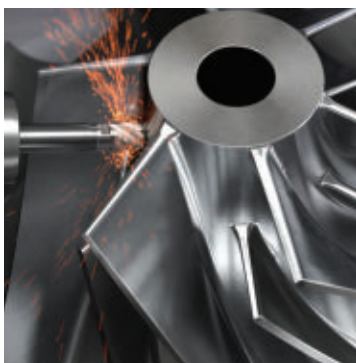
### Ceramic Milling Heads for HRSA Machining

*offer higher productivity for milling nickel-based alloys*

The ceramic grade **CoroMill 316** is optimized for performance in nickel-based alloys, offering a more productive method for roughing in ISO S materials than standard carbide milling cutters. Its 6-flute geometry delivers productive side milling operations, while the 4-flute geometry boosts face milling. Beyond shoulder and face milling, the new end mills can also be used for pocket milling, helical interpolation, ramping, and slot milling.

**Sandvik Coromant**

More online: [newequipment.com/21272754](http://newequipment.com/21272754)



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## RACO International, LP

RACO Electric Actuators provide a reliable solution for all of your linear and rotary motion needs. A variety of design configurations provide a multitude of thrust and speed ratings. RACO Electric Actuators are designed to be robust with virtually no maintenance while also being economical to operate and friendly to the environment.



### RACO MA-Series

The modular design of RACO ACME and Ballscrew Electric Actuators allow for a variety of design configurations while offering a Linear Thrust range from 70lbs to 225,000lbs, Linear Rod Speeds from 0.2"/sec to 30"/sec and Linear Travel (stroke) up to 20 ft.

### RACO LM-Series

The RACO LM-Series is designed for high speeds and long travel (stroke) with capabilities that are frequently found in today's automation processes. The LM can be used as a single axis system or can be combined to form a multiple axis system.



### RACO Rotary-Series

The Rotary Actuator is designed to automate the operation of valves, gates, dampers, louvers and other positioning applications requiring partial or multi-turn rotational movement.



## RACO International, LP

3350 Industrial Blvd. | Bethel Park, PA 15102

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## GENERAL PRODUCTS

### FROM THE COVER



### Robot Simulation Cloud Platform

*allows teams to collaborate from anywhere, on any device*  
ABB has enhanced its RobotStudio robot programming and simulation software with cloud-enabled functionality. The **RobotStudio Cloud** enables individuals and teams to collaborate in real-time on robot cell designs from anywhere in the world, on any device. Features such as automatic version control increase transparency and productivity across teams. The software's simplified interfaces and intuitive navigation allow users of all skill levels to work on robotic projects.

New features include version control, which allows users to keep track of changes and have full transparency of any amendments. With complete knowledge of who edited the program and when, developers can cut the time needed to resolve errors and performance issues.

Incorporating RobotStudio's cloud-based virtual controllers, developers have a rapid and powerful robot simulation tool to tune and test programs. By producing an exact digital twin, the virtual controllers give developers complete confidence that the robot will move as precisely as in the simulation.

### ABB Robotics

**More online: [newequipment.com/21272787](http://newequipment.com/21272787)**



### Compact, Quiet, Low Maintenance Compressors

*are ideal for small shops with tight spaces*

Available in 2 sizes and 3 configurations (G, Tower, and Tower T), the **i.Comp 8 and 9 oilless compressor series** deliver oil-free air up to 160 psi and 20 cfm. These units are compact, quiet, and energy efficient and eliminate nearly all routine service. The compressors feature a 2-cylinder, single-stage oilless compressor with an integrated direct drive motor. Pressures can be adjusted with the SIGMA CONTROL 2 controller.

### Kaeser Compressors, Inc.

**More online: [newequipment.com/21272854](http://newequipment.com/21272854)**



### High-Temperature Biodegradable Grease

*is highly inhibited against moisture and rusting*

**Bio-High Temp 180 EP Grease**, a multipurpose lithium complex grease, withstands high temperatures and is biodegradable. This formulation uses super high viscosity index base oil and lithium complex thickener to provide a very high load-carrying capacity, resistance to water and corrosion, and handles a wide range of temperatures. It's ideal for use in conveyor rollers, bearings, electric motors, pumps, and more.

### Renewable Lubricants, Inc.

**More online: [newequipment.com/21272855](http://newequipment.com/21272855)**



### Ergonomic Vehicle Trailer Lift

*provides balanced leveling with roll-off protection*

The **Rite-Hite Trailer Lift (RHTL)** raises any vehicle to proper dock height while leveling the trailer bed to protect cargo and make forklift loading/unloading more ergonomic. With a reinforced platform and larger hydraulic cylinders for increased lift, it provides full, unobstructed access to vehicles and loads, providing a universal fit regardless of vehicle bed height. Its 4-panel design allows for gentle inclines and declines to keep the trailer bed level and ensures proper alignment to keep trailer tires centered and in place.

### Rite-Hite

**More online: [newequipment.com/21272765](http://newequipment.com/21272765)**

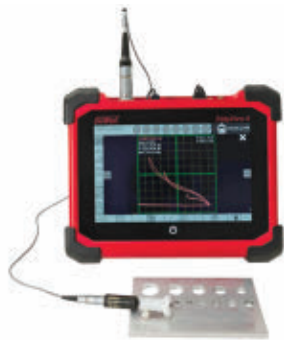


### Comfortable & Secure Work Boot

*has safety toes that don't weigh you down*  
Built to thrive on the toughest job sites, the **Camden** work boot provides rugged capability without weighing you down on the job. The boot includes a full-grain barnyard-resistant leather upper, KEEN.DRY waterproof, a breathable membrane, and a 360-deg. Goodyear welt and air-infused Luftcell midsole for a stable and comfortable platform. The boot also has carbon-fiber safety toes, a slip-resistant outsole, and a 90-deg. heel for secure footing.

**KEEN Utility**

More online: [newequipment.com/21272803](http://newequipment.com/21272803)



### Portable Eddy Current Flaw Detector

*features industry-leading signal-to-noise quality*

Featuring an 8-in. (200 mm) touch-screen display with parameters such as gain and rotation, the **EddyView II** portable eddy current flaw detector allows both standard eddy current measurements and complex inspections, including the use of array probes up to 32 elements as well as automated and robotic applications. It has the ability to drive conventional probes or array probes, an independent channel that monitors probe-to-part coupling (lift-off), and low signal-to-noise.

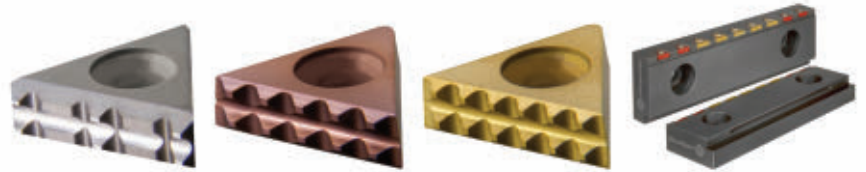
**UniWest**

More online: [newequipment.com/21272761](http://newequipment.com/21272761)

### Low Profile Clamping Inserts

*eliminate the need for pre-machining or dovetailing workpieces*

Low-profile inserts called **GripSerts** are made to grip steel workpieces with only 0.14 in. (3.5 mm) of clamp surface needed to securely hold the workpiece.



The TG GripSerts are ideal for 5-axis machining operations. Because of the geometry of the grippers, the inserts create a pull-down effect that prevents any lifting of the workpiece while clamping. These inserts combine a tough-coated cemented carbide with specialized teeth and triangular shapes that are uniquely designed to penetrate steel.

**Fixtureworks**

More online: [newequipment.com/21272804](http://newequipment.com/21272804)



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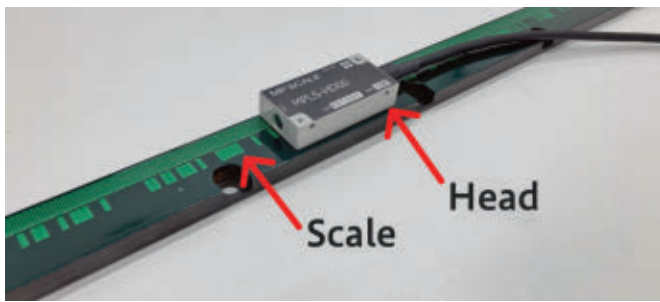


**Slim & Simple Linear Position Detectors**

*detect all strokes' absolute values*

The **MPLS series** is a high-performance scale capable of detecting a linear axis's position, with a resolution of 0.05  $\mu\text{m}$  and a pitch accuracy of 10  $\mu\text{m}$ . They use a newly developed detection pattern to receive scale-generated signals without interference, eliminating the need for scale wiring. It uses its scale and head to transmit/receive signals from a machine's control unit.

**Nidec Machine Tools**



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Vacuum Cleaner	80 dB
Alarm Clock	75 dB
Noisy Restaurant	70 dB
Piano	65 dB
Speaking Voice	60 dB
Quiet Office	55 dB

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CANAlarm™, Ultra™ Series, M-80 Series, Turbo™ X-tra Loud Series, Audiolarm II™ Medium Loud Series, Twin Turbo™ Series

Turbo™ Medium Loud Series, OneTouch Silencer™ Series, Audiolarm II™ Medium Loud Series

Announcer™ AN100/AN125, Audiolarm II™ Low Output Series



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*help maximize performance while limiting TCO*

Part of the A Series platform, the **H40-70A series** are 4,000 to 7,000-lb. (1,800 to 3,100 kg) capacity lift trucks featuring the Dynamic Stability System (DSS). DSS uses sensors to continually monitor truck status. When it detects the truck exceeding designated thresholds, DSS automatically implements measures like limiting truck speed and hydraulic function, to help minimize the risk of forward and sideways tip-overs. The operator compartment has easy entry and exit with a lowered seat, increased floor space, and generous head and shoulder clearance.

**Hyster Company**

More online: [newequipment.com/21272790](http://newequipment.com/21272790)

**Pipe Beveler for Small Alloyed Tubes**

*enables users to achieve x-ray welds without hand grinding*



The **Esco Ground MILLHOG Beveler** is a right-angle drive I.D. clamping tool that features a push-pull clamp and release mechanism that engages and disengages easily. Ideal for beveling tubes and small pipes with a high percentage of chrome, this tool produces precision welding end preps without cutting oils and comes in pneumatic, electric, and battery-powered models.

**ESCO Tool**

More online: [newequipment.com/21272778](http://newequipment.com/21272778)

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FALL 2023

# LEADERS IN MANUFACTURING



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## LEADERS PROFILE

## ACE CONTROLS INC.



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ACE components can be used in a variety of applications and industries such as aerospace, aviation, machine building, marine, medical, oil & gas, packaging, and robotics. From up in the air to under the sea, ACE products:

- Slow down moving loads
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- Reduce vibration and noise
- Protect against wear and tear
- Reduce downtime
- Increase throughput
- Increase safety

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## Automation Control

### Optimum tuning for any design

ACE universal damping solutions convert kinetic energy in to heat. This makes machines faster, quieter, more durable, lighter, and therefore, more competitive and profitable. Here you will find the perfect selection of machine elements, which turn damaging forces into harmless heat. These solutions from ACE smoothly decelerate moving loads. This involves the lowest possible stress on machines, which makes the damping products from ACE so valuable.

## Motion Control

### Custom control of hand forces

The ACE products in this segment enhance the quality of any type of movement. Anyone who wants to raise or lower loads, regulate the feed of an object to the precise millimeter or gently decelerate rotating or linear movements will find the right solution here. ACE delivers industry leading quality. Our innovative solutions correspond with stringent requirements for ergonomics and individuality, including custom pressurized gas springs.

## Vibration Control

### Isolate unwanted vibrations

This ACE product group includes innovative solutions to provide customers with the best assistance in isolation technology and vibration isolation. These machine elements are also distinguished by their light design and wide variety. The product range extends from extremely low frequency isolating pneumatic leveling mounts to ready-to-install rubber-metal isolators and damping pads. With this portfolio, ACE is capable of offering you customized vibration isolation for almost any application.

## Safety Products

Protection for all machine designs under any condition. This ACE product group provides emergency braking to safely slow down moving loads and reduce damaging forces. Although the safety shock absorbers, TUBUS elastomer bumpers and clamping elements differ so much in design, every single ACE component provides the best protection for your machine. They demonstrate their main advantages in Safety Products emergency stop situations and, based on the protection they provide, are very cost-effective. Furthermore, they can all be easily integrated into existing design and largely work independent of energy supplies.

## Engineering Tools & Resources

ACE has simple solutions to make your job easy, including a host of online resources and one-on-one assistance. Connect with ACE's application engineers who will work with you to calculate and select the right product for your needs. Or, take advantage of our online tools:

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- ACE CAD database
- ACETips video tutorials
- Technical blog & case studies





## LEADERS PROFILE

# ADVANCE LIFTS®

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Advance Lifts was founded in 1974 and quickly became the leading dock lift manufacturer in the country. We have maintained that position through innovative design, quick deliveries, and superior service. Our goal is to make the entire process of buying, installing, using, and servicing of our products as easy and trouble free as possible for each and every customer.

We are also dedicated to the principle of producing the most durable products in the industry. Our loading dock lifts, industrial scissors lift tables, industrial turntables, container tilters, container dumpers, work access lifts, multistage lifts, and reciprocating conveyors all have the longest and best warranties in their respective product groups.

Responsiveness is a key driver in our operations. More than 80% of the calls for quotations are satisfied during the initial phone call. Our service department is staffed so that knowledgeable people are available on initial calls and rarely require return calls.

Additionally, our services include the most complete website in the industry. Our website is available 24/7 and contains interactive product selection aids, photos, videos, operational specifications, architectural specifications, installation drawings, product manuals, and a listing of our nationwide distributor network. Therefore, if you have questions about our industrial lifts, you can get answers by calling a local distributor, calling the factory direct or by visiting our website.

The final element of our value package is our nationwide network of knowledgeable distributors. We routinely service nationwide retail chains, manufacturers, and government agencies with seamless coordination between our distributors to provide outstanding sales, installation, and operational service.

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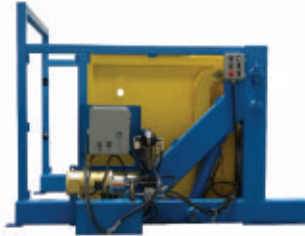
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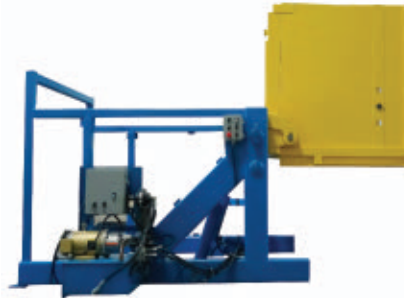
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## LEADER PROFILE

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You can call Lubriplate's technical service center toll free at (800) 347-5343 for quick answers to tough lubrication questions by phone, or you can email questions to [LubeXpert@lubriplate.com](mailto:LubeXpert@lubriplate.com) seven days a week.

#### Complete Plant Surveys and Lubricant Inventory Consolidation

Complete plant surveys by Lubriplate's professional staff of lubrication engineers are also available to determine your exact lubricant requirements and identify opportunities for lubricant inventory consolidation.

#### Customized, Color Coded, Lubrication Charts and Machinery Tags

Lubriplate offers color coded lubrication charts and machinery tags to help prevent lubricant misapplication and ensure that the proper lubricant is used when servicing a particular piece of equipment. Based on a complete plant survey, tags can be provided for each piece of equipment in your plant.

#### Lubrication Maintenance Software

Lubriplate offers a PC-based computer software program that puts your entire lubrication and maintenance schedules at your fingertips. This service is based on a complete survey of your entire plant. Contact Dan Moroses (Newark office) for details at (973) 589-9150.

#### No-Charge Follow-up Oil/Fluid and Grease Analysis

Lubriplate's Oil/Fluid and Grease Analysis Program is offered at no-charge on all Lubriplate products. Tests include Viscosity, Acidity, Contamination (% sediment and % moisture), Spectrochemical (PPM of wear metals and additives), and ISO Cleanliness (optional). An interpretation of the results is included along with suggested actions to take.

#### In-Plant User Lubrication Training Programs

We offer training programs tailored to fit your needs. These educational training sessions focus on all facets of machinery lubrication and are not a sales presentation. Seminars are graphically presented with PowerPoints and other support material. Available on-site at your facility or in a local conference room. Contact us at (800) 733-4755 for more information.



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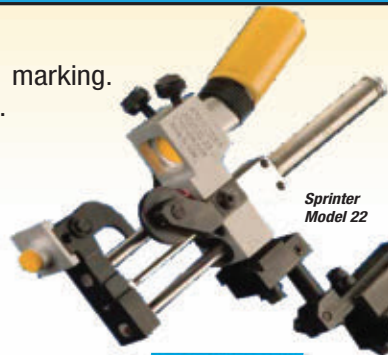


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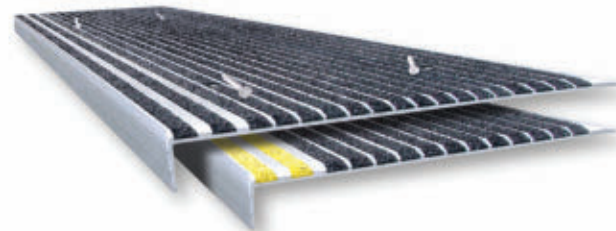


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**John DiPaola**  
Vice President & Group Publisher:  
[jdipaola@endeavorb2b.com](mailto:jdipaola@endeavorb2b.com)

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## FROM THE COVER



### Reactive Extrusion 3D Printers *are an affordable alternative to typical 3D printers*

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## FROM THE EDITOR

## Business Season

It's that time of year for strategy meetings and planning for 2024. I can't believe the year is almost over. I also can't believe it's going to be 2024. I still feel like the pandemic was *maybe* 2 years ago—it's about to be 4 years ago.

In these meetings, we've been talking a lot about you, the readers, and what you want out of **NED**. There's always the fear of trying to fix what isn't broken. But, you can always do better, so we're going to try and do better, be better, and provide better content. We have some plans to get out to the large trade shows next year for those of you who can't attend. We also have a new print surprise as well coming in the new year, but you'll have to wait for that announcement.

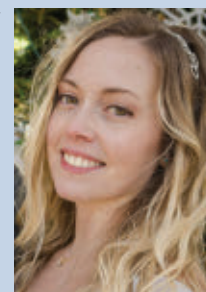
Speaking of print, it's no surprise that print is not the growing, burgeoning industry that it once was. Digital content is taking over, for better or for worse. Because of this, we have a lot of great content on our site that never sees the inside of a print issue that's also worth checking out. As you know there are many, many more products we cover that we just don't have the space to include in print, there's content that explains the ins and outs of how to use these pieces of equipment, how to know if you're choosing the right equipment, and innovations that are coming out of the research space.

If you head on over to the website, you'll see that we just updated our logo (our print update will be coming next issue). The idea behind the updated logo was to offer a fresher look to **NED** as well as our new collaboration with our sister brand, **Plant Services**, which we now feature a monthly article from in this issue called the Tech Toolbox, by Sheila Kennedy, CMRP—you can read it on page 5. The Tech Toolbox series is all about the most recent, new technology and products that are solving a specific problem in the industry. This month's is all about vibration analysis and mitigation for machinery.

You might be thinking that that type of article sounds like it could come from **NED** itself, and you would be right. This is why we have collaborated with **Plant Services**, a publication that focuses on plant operations, maintenance, reliability, and thought leadership. They're a new publication that came over a little over a year ago from another media brand, and they're a great fit with **NED**. If you like the Tech Toolbox article, I would urge you to go check out their website at [www.plantservices.com](http://www.plantservices.com) as they have tons of great content that dives deep into industrial technology and reliable asset management that promotes safe, sustainable plant operations.

That's all I have for this one, so thanks for reading and I'll see you all in our November issue.

— **Laura Davis**, Editor-in-Chief





# 7 Common Issues With CNCs (And How to Fix Them)

By Vincent Hua

## COMPUTER NUMERICAL CONTROL (CNC)

machines are automated or computer-driven motion control machines that have helped make the manufacturing industry more efficient. These tools are so efficient that they can create parts out of almost any hard material.

However, when it comes to technical flaws, design oversights, and other software glitches, no technology is perfect, and CNC machines are no different.

From jamming parts to power supply failure and erroneous tool cutting to wrong programming, an entire gamut of issues may crop up during the machining process, which may overwhelm manufacturers. However, there are always ways to fix them.

Here's a look at some of the commonly encountered issues in the setup and maintenance of CNC machines with potential remedies to correct them.

### 1. Errors in Codes

Perhaps one of the major issues that trouble computer-driven machines can be attributed to errors in programming. These programming errors could either come from the lack of understanding of the fundamentals of different G and M codes or from writing wrong data variables into the controller of the CNC machine. If the programming is erroneous, the machines will not function properly.

**How to Fix:** To ensure that there are no particular errors in the machines at the level of codes, the CNC machining

center should hire excellent coders who are adept at writing good codes. Machine operators should also be well-versed in the comprehensive user manuals to know the CNC machines inside and out.

### 2. Poor Maintenance

Machines that require constantly moving mechanical systems must be regularly maintained to function at their optimal best. Such tools must be cleaned so that any dirt, material or debris does not jam the machines. Failure to regularly maintain can lead to debris and dirt build-up over time, resulting in failures and inaccuracies.

**How to Fix:** The only and best way to resolve this issue is to ensure that operators follow a regular maintenance and clean-up routine for their CNC machines. Besides cleaning dirt and dust, machine operators should frequently check air filters more prone to debris.

### 3. Machine Vibration Issues

The efficiency of some machines can be measured by how well they vibrate. However, with CNC machines, vibrations are not recommended. If a CNC machine vibrates while performing a task, it could potentially reduce the lifespan of that tool. It may also affect its durability and long-term functionality. CNC machines that take more time than doing a task that, on average, takes less time are not cost-effective, and workshop managers may have to sell the CNC milling machines.

**How to Fix:** To identify the machine's vibration issues, the machine operator must diagnose whether the chatter comes from the workpiece or the tool itself. They can try adjusting the machine's rpm using a balanced tool holder. Try maintaining spindle speeds above 8,000 rpm.

### 4. Incorrect Settings Selection

Selecting an incorrect or inapplicable setting for a specific task often results in poor-quality material finishes. A custom CNC machining must have preselected appropriate cutting tools and settings to work precisely. Incorrect settings result in burn marks, rough corners, blunt edges or visible marks.

**How to Fix:** To rectify this, operators must choose appropriate settings, ensure proper clamping, and set up the hydraulic pump and pressure before operating machines. Parts must be correctly positioned, and other tools should be adequately set up.

### 5. Overheating

CNC machines run for extended periods and perform a high volume of daily tasks without resting, which may cause overheating. Machinery experts advise that a regular CNC machine should not hit temperatures beyond 150°F. Overheating comes with its own sets of problems that may adversely affect these machines.

**How to Fix:** Overheating mainly happens due to an irregular maintenance regime, such as not regularly cleaning and clearing all channels within the system from dirt, material, and debris. This means the machine operator needs to clean the machine regularly. Overheating can also result when the CNC continuously runs at the highest rpm. While some CNC machines that run on oil-jet lubrication can run at the highest rpm for a prolonged period, not all spindles are the best. Depending on the CNC machine, the working duration of these machines should be decided. Issues with overheating can also happen due to variations in temperatures in the environment where the machine is placed. If the workshop is not properly ventilated, it may cause the environmental temperature to influence the engine to overheat. Workshop managers should place the CNC so it's exposed to air and sunshine.

### 6. Incompatible Power Supply

CNC machines are highly complex, and they may display specific issues with their functioning due to power supply problems. This is why CNC machines must operate at appropriate power supply settings.

**How to Fix:** To resolve this issue, the machine operator should ensure that the correct power and voltage supply is used for the power and supply input. If the power or voltage is low or none, try disconnecting output wires when the power is off. While an elementary system examination for power issues can be done, it's always recommended to consult an electrician or a specialist to check for issues related to power or connections.

### 7. Lack of Trained Operators

Human errors are unavoidable. However, hiring untrained or semi-trained operators can lead to more human errors. Operating CNC machines requires years of training.

**How to Fix:** Hire skilled workers and continuously organize training workshops on the machines, especially when new machinery upgrades are made. **NED**



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## A Window of Opportunity

### Take Advantage of Energy Recovery Solutions

Atlas Copco's energy recovery solutions capture compression heat that can be reused, allowing you to cut energy bills, reduce fossil fuel usage, and minimize your carbon footprint. If your compressed air system is not driving your sustainable future—now's the perfect time to get started!



866-472-1013



[www.atlascopco.com/ER](http://www.atlascopco.com/ER)