ADVANCING THE FUTURE OF INDUSTRIAL OEM POSITION SENSING WITH LVIT TECHNOLOGY



As industrial automation, mobile equipment, and smart machinery continue to evolve, OEMs face increasing pressure to deliver systems that operate with greater precision, durability, and reliability under ever more demanding conditions. Linear position sensing technology has become a foundational component in achieving these goals, particularly in applications exposed to shock, vibration, contamination, and continuous-duty operation.

Alliance Sensors Group (ASG) has emerged as a leading innovator in industrial position sensing through its advanced LVIT (Linear Variable Inductance Transducer) technology. By leveraging contactless inductive sensing, ASG eliminates the physical contact between moving sensor components that can lead to friction, wear, and performance degradation over time.

This contactless design prevents wear-out caused by continuous cycling, vibration, or dither motion, small repetitive movements that can rapidly shorten the lifespan of conventional contact-based sensors. As a result, LVIT sensors deliver exceptional durability, long-term measurement stability, and maintenance-free operation even in demanding environments. Combined with rugged industrial engineering, ASG provides OEMs with highly configurable sensing solutions specifically designed for harsh applications where reliability, uptime, and sensor longevity are critical and failure is not an option.

This paper explores how Alliance Sensors Group is helping OEMs modernize motion control and feedback systems through scalable, application-specific LVIT solutions. It also highlights the strategic advantages of the company's flagship sensor platforms: the LZ-13, LZ-9.5, and LZ-19 series, which are setting new benchmarks for compact integration, industrial durability, and precision performance.

THE GROWING DEMAND FOR RUGGED POSITION SENSING IN INDUSTRIAL OEM MARKETS

Industrial OEMs today operate in an environment defined by accelerating automation, tighter process tolerances, predictive maintenance initiatives, and growing expectations for machine uptime.

Whether in factory automation, mobile hydraulics, agricultural machinery, test equipment, or heavy industrial systems, accurate linear position feedback is essential for maintaining operational efficiency and equipment reliability.

Traditional sensing technologies often struggle in these environments due to mechanical wear, contamination sensitivity, or inadequate durability under constant vibration and motion. OEM engineers increasingly require sensors that can:

- Deliver repeatable precision over long operating lifecycles
- Resist contamination from dust, oil, moisture, and debris
- Integrate easily into compact or legacy machine designs
- Reduce maintenance requirements and downtime
- Support high-cycle, continuous-duty operation

UNDERSTANDING LVIT TECHNOLOGY

LVIT technology represents a major advancement in industrial linear position sensing. Unlike traditional contact-based sensing systems, LVIT sensors utilize an inductive operating principle that eliminates typical mechanical wear components.

EXCEPTIONAL RELIABILITY

Without physical contact between moving elements, LVIT sensors experience minimal wear over time. This allows ASG sensors to maintain calibration integrity and repeatable accuracy over millions of operational cycles.

SUPERIOR ENVIRONMENTAL RESISTANCE

Inductive sensing technology inherently withstands contamination from oil, dirt, moisture, vibration, and EMI (Electromagnetic Interference) better than many conventional sensor technologies.

CONTINUOUS-DUTY PERFORMANCE

ASG LVIT sensors are engineered specifically for industrial environments requiring nonstop operation, making them ideal for automation systems, hydraulic equipment, and mission-critical machinery.

ENHANCED PRECISION AND STABILITY

LVIT technology provides highly accurate position feedback with excellent sensor linearity and long-term signal stability, helping OEMs improve machine control, repeatability, and operational efficiency.

ALLIANCE SENSORS GROUP: ENGINEERING BEYOND THE SENSOR



What differentiates Alliance Sensors Group from many sensor manufacturers is not simply its technology platform, but its engineering philosophy.

ASG approaches OEM relationships as collaborative engineering partnerships rather than component transactions. The company's application-driven model enables OEMs to work directly with experienced sensor engineers to develop optimized solutions tailored to specific machine architectures and environmental requirements.

With more than 100 years of resident application engineering expertise, ASG helps customers to:

- Accelerate product development timelines
- Solve complex mechanical integration challenges
- Improve position sensing reliability in harsh environments
- Reduce update redesign costs
- Optimize sensor packaging and performance
- Transition legacy systems to modern sensing technologies

This consultative approach has positioned Alliance Sensors Group as a trusted strategic supplier/partner across numerous industrial sectors.

THE LZ SERIES: A NEW STANDARD FOR OEM LVIT POSITION SENSORS

Among ASG's most impactful innovations are the LZ Series LVIT position sensors, which deliver exceptional flexibility, compact packaging, and industrial-grade performance for OEM applications at OEM pricing.

The LZ family was developed specifically to address modern OEM design requirements where space limitations, environmental durability, and precision control must coexist.

LZ-9.5 Series: Compact Performance for Space-Constrained Designs

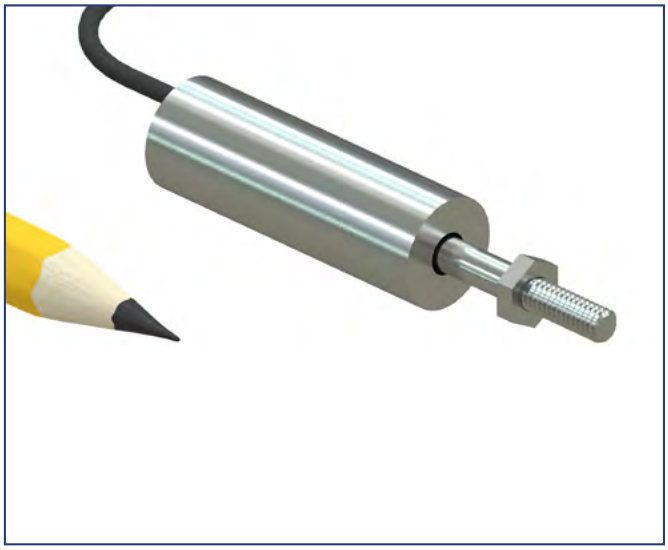
The LZ-9.5 Series LVIT sensors are engineered for OEM applications where installation space is limited but measurement accuracy and reliability remain critical. Featuring an ultra-compact form factor, the LZ-9.5 enables seamless integration into hydraulic cylinders, mobile equipment, industrial automation systems, and other compact assemblies. Despite its small footprint, the sensor delivers precise, repeatable linear position feedback while maintaining the ruggedness required for demanding operating environments. Its contactless design minimizes wear and extends service life, helping manufacturers reduce maintenance requirements and improve long-term system performance and reliability



LZ-9.5 Series

LZ-13 Series: Versatile Sensing for Industrial Motion Control

The LZ-13 Series represents a highly versatile position sensing platform designed to meet the evolving needs of industrial OEMs. Offering an optimal balance of size, durability, and measurement capability, the LZ-13 is well-suited for a broad range of motion control and positioning applications. The sensor's non-contact LVIT technology provides reliable, high-resolution feedback without the mechanical wear associated with traditional contact-based devices. With its robust environmental resistance and flexible integration options, the LZ-13 enables manufacturers to enhance equipment precision, improve operational uptime, and support increasingly sophisticated automation requirements. These LZ-9.5 and LZ-13 compact, contactless LVIT sensors help OEMs improve performance, reliability, and lifecycle value while meeting the increasing demands of modern machine design.



LZ-13 Series

LZ-19: Long Range Sensing for Typical Industrial Environments

For longer range-of-motion industrial equipment and select heavy-duty applications, the LZ-19 series delivers exceptional durability and sensing stability under challenging operating conditions.



LZ-19

Built for industrial environments where hardware experiences intense vibration, shock loading, contamination, and continuous-duty operation, the LZ-19 is optimized for applications such as:

- Agricultural machinery systems
- Industrial hydraulic cylinders
- Material handling equipment
- Mobile construction equipment
- Continuous-duty industrial automation

The LZ-19 provides robust mechanical construction combined with ASG's proven LVIT inductive sensing technology to ensure dependable operation in moderately harsh field environments. Its ability to maintain precision feedback despite aggressive operating conditions allows OEMs to improve machine control, reduce maintenance intervals, and minimize costly downtime.

LZ-19 UL: UL Listed Hazardous Location Position Sensing

Designed specifically for equipment operating in hazardous locations and regulated environments, the LZ-19 UL combines the proven performance of ASG's LVIT technology with UL Class I Division 2 Groups C & D Hazardous Location approval for applications where NRTL safety certification is required.



LZ-19 UL

The LZ-19 UL provides OEMs with a rugged, position sensing solution capable of delivering reliable feedback in environments where combustible gases, vapors, or dust may be present.

Typical applications include:

- Oil and gas field production equipment
- Petrochemical processing systems
- Refining operations
- Chemical processing facilities
- Power generation equipment
- Industrial process control systems
- Bulk material handling operations



Like all Alliance Sensors Group LVIT sensors, the LZ-19 UL utilizes an inductive operating principle that eliminates mechanical wear while providing exceptional resistance to contamination, shock, vibration, and other harsh environmental conditions.

For OEMs designing equipment for hazardous areas, the LZ-19 UL offers the dual benefit of dependable position feedback and NRTL compliance, helping simplify system design while supporting safe, reliable operation.

CONFIGURABILITY: ENABLING TRUE OEM FLEXIBILITY

One of the defining advantages of Alliance Sensors Group's LVIT product line is its broad-based configurability.

OEMs rarely operate with standardized requirements. Machine architectures vary widely in terms of:

- Mounting space constraints
- Ranges of motion
- Environmental exposure
- Electrical interface requirements
- Mechanical mounting conditions
- Duty cycle expectations

ASG addresses these challenges by offering highly customizable position sensor configurations, including:

- Wide range of stroke lengths
- Diverse housing styles
- Various output signal options
- Custom mounting arrangements
- Environmental sealing enhancements
- Application-specific packaging solutions

This flexibility enables OEM designers to optimize sensor performance without compromising overall machine design objectives.

SUPPORTING INDUSTRY 4.0 AND SMART MANUFACTURING

As Industry 4.0 initiatives continue reshaping industrial operations, accurate and reliable position feedback becomes increasingly important.
Modern OEM equipment requires sensing systems capable of supporting:

- Predictive maintenance strategies
- Advanced motion control
- Automated process optimization
- Real-time diagnostics
- Intelligent machine feedback systems

Alliance Sensors Group's LVIT technology supports these evolving requirements by delivering highly stable, repeatable position data that can be integrated into advanced automation and monitoring platforms.

The durability and long-term stability of ASG sensors also help reduce maintenance-related disruptions, supporting higher Overall Equipment Effectiveness (OEE) across industrial operations.

PROVEN PERFORMANCE ACROSS CRITICAL INDUSTRIES

Alliance Sensors Group sensors are trusted across a wide range of industrial sectors where reliability and precision are mission-critical.
These industries include:



FACTORY AUTOMATION

ASG LVIT sensors improve positioning accuracy and process consistency in automated manufacturing systems.



MOBILE HYDRAULICS

Rugged inductive sensing supports reliable operation in construction, agricultural, and utility vehicles exposed to severe vibration and environmental conditions.



HEAVY EQUIPMENT

Durable sensor construction enables dependable performance in demanding continuous-duty machinery.



TEST AND MEASUREMENT

High repeatability and precision support accurate data collection and motion control applications.



INDUSTRIAL MACHINERY

ASG sensors enhance machine reliability while reducing maintenance requirements and production line downtime.



OIL, GAS, AND CHEMICAL PROCESSING

The LZ-19 UL provides hazardous location approved position feedback for critical equipment operating in oil & gas, petrochemical refining, and chemical processing facilities. Its contactless inductive design delivers truly reliable performance in demanding environments where safety, compliance, and uptime are essential.

THE STRATEGIC VALUE OF ENGINEERING PARTNERSHIP

Increasingly, OEMs are seeking technology suppliers who can contribute engineering insight rather than simply provide hardware. Alliance Sensors Group's collaborative approach delivers strategic advantages that extend well beyond component selection. Through direct application engineering engagement, ASG helps OEMs to:

- Reduce technical risk
- Improve product reliability
- Optimize sensing architectures
- Accelerate prototype development
- Resolve application-specific challenges
- Improve long-term life-cycle performance

This engineering partnership model creates stronger alignment between sensor performance and overall machine performance objectives.

Industrial OEMs face mounting demands for precision, durability, and operational reliability in increasingly complex machine environments. Position sensing technology plays a critical role in meeting these challenges, particularly in applications where harsh operating conditions could compromise many alternative sensor solutions.
Alliance Sensors Group continues to lead the charge in industrial OEM sensing innovation through its advanced LVIT technology platform and customer-focused engineering approach. By delivering rugged, contactless, highly configurable sensing solutions, ASG enables OEMs to build smarter, stronger, and more reliable machines.

The company's LZ-9.5, LZ-13, LZ-19, and LZ-19 UL series exemplify this commitment by providing scalable sensing solutions tailored to compact, versatile, heavy-duty, and hazardous-location industrial applications. From factory automation and mobile hydraulics to oil & gas and process industries, Alliance Sensors Group continues to help OEMs solve complex motion and position feedback challenges through rugged LVIT technology engineered for long-term reliability.

As automation, smart manufacturing, and advanced motion control continue shaping the future of industrial equipment, Alliance Sensors Group remains positioned as a trusted partner helping OEMs transform engineering challenges into competitive advantages through precision inductive sensing technology.

By delivering reliable, high-performance linear position sensing solutions that support greater accuracy, efficiency, and system intelligence, Alliance Sensors Group enables manufacturers to meet evolving market demands while reducing complexity and improving long-term operational performance. As next-generation machines become increasingly connected, adaptive, and data-driven, the role of precise, dependable sensing technology will only grow in importance. With a commitment to innovation, application expertise, and customer success, Alliance Sensors Group is helping define the future of industrial motion control.



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