



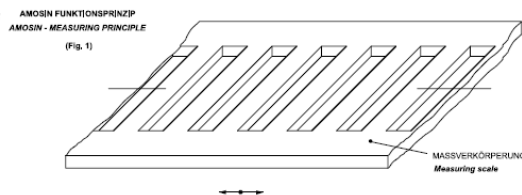
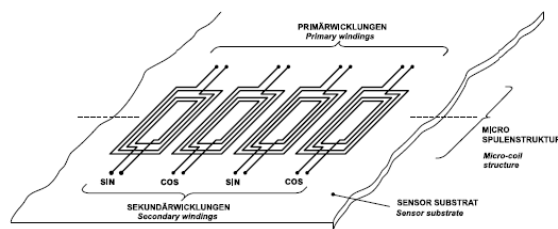
Company Overview

AMO GmbH was established as a company in 1994. The initial development phase of our inductive length and angle measuring systems were completed after one year and product introduction began. AMO began work on the second generation inductive encoders, making advances for higher accuracies and product miniaturization.

The result was the first **AMOSIN®** series of length and angle measuring systems which have been proven to be very successful and well received in the marketplace. With this development we advanced into "high end signal sub-division" which allowed us to offer resolutions and accuracies that had previously only be achievable with optoelectronic encoder systems. The substantial growth of the company required additional manufacturing space and the company moved into a new and larger building in autumn 2007. As the company has grown, we now have subsidiaries in Germany, USA and Italy, and have established a large dealer network in other industrialized countries. We implemented the Quality Management system DIN EN ISO 9001:2000 in the year 2005 to maintain and verify our high quality standards.

Technology Overview

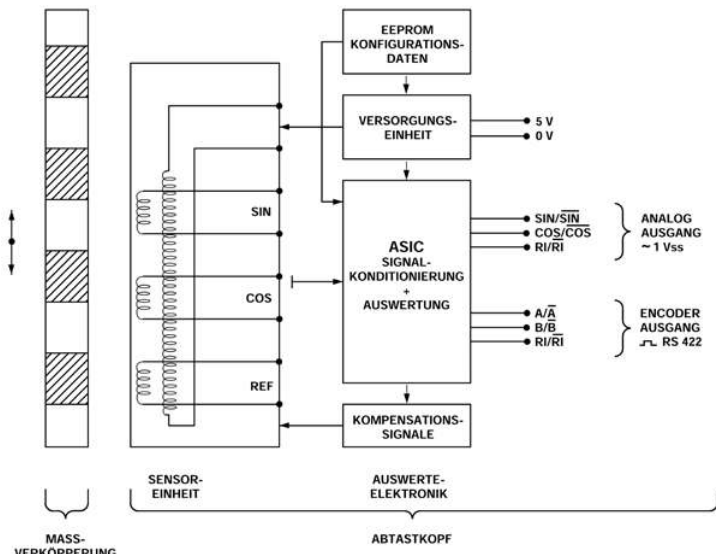
The **AMOSIN®** measuring systems function on a patented purely inductive principle. The measuring scale is a stainless-steel tape onto which a high precision periodical graduation of variable reluctance has been etched using photo-lithographic techniques.



A coil structure, with a number of coils aligned in the direction of measurement, is implemented on a substrate using micro-multi-layer technology. The relative angular movement in the direction of measurement between the sensor structure (in the scanning head) and the measuring scale periodically changes the mutual inductance of the individual coils, generating two sinusoidal signals with a 90° phase difference. The extremely accurate signal, and its immunity to environmental influences, has the effect that, after conditioning of the signal in the

evaluation electronics deviations of no more than 0.1% from the ideal sinusoidal form (harmonic content) remains. This allows high interpolation factors (further levels of subdividing) to be carried out in the course of signal digitization. This can either be done in the measuring system itself, or in the subsequent electronics.

An important feature is that using the patented **AMOSIN®** measuring principle does not give rise to any measurement hysteresis (machine backlash error). In contrast to magnetic systems, the high-frequency alternating field suppresses any hysteresis in the material. The evaluation electronics provides an incremental output either as a sinusoidal or as a square wave signal. The 1Vpp sinusoidal signal is available with period length down to 20 µm. This is equivalent to 32768 signal periods/revolution on a rotary system with a diameter of 163mm for example. Alternatively a TTL square wave output with resolution down to 0.125 µm can be used. In addition to the periodic quadrature signals (A, B and their complements) a reference signal is output for the determination of absolute position. This signal is generated from a single, multiple or distance coded pattern of reference marks integrated into the measuring tape and does not require any additional parts.



Product Overview

AMOSIN® - angle measuring systems

AMOSIN® angle measuring systems can be applied to a wide range of applications due to the pure inductive scanning principle and the robust IP 67 rating. Almost any diameter from about 80 mm up to several meters can be manufactured in a short time.

Our encoders can be supplied for not only high speed applications for spindles but also for extremely high accuracies for rotary tables and swiveling axes.



AMOSIN® - length measuring systems

Open non-contact, and guided inductive linear encoder systems are available for any measuring length. With the inductive scanning principle, exceptionally high speed operation, and bi-directional repeatability of one encoder count, the



AMOSIN® length measuring systems can be used in an exceptionally wide range of applications from precision measurement instruments, to high-dynamic linear motor applications, to the harshest applications in machine tools, where **robustness along with precision** are required. Reference marks are integrated on the measuring tape, and can be supplied with a single, multiple, or distance coded patterns. The purely inductive scanning allows for the high protection class IP67 where the operation of the systems is not affected by contamination and pollutants in the form of dust, smoke, or liquids. Optical encoders require a complicated mechanical encapsulating enclosure, and also commonly incorporate air purging to protect the optical scale – neither which are necessary with the **AMOSIN®** encoders. Particularly noteworthy is the insensitivity from magnetic interference as there are no magnetic components in the purely inductive scanning and a completely different technology than magnetic encoders.

Products

LMI-100

- Open measuring system
- Miniature design with connector electronics
- No wear
- Ideal for applications with high dynamic range (up to 20 m/s)
- High precision ($\pm 5 \mu\text{m}$)
- Suited for long travel (up to 30 m)
- Available with 1Vpp or TTL (down to $0.125 \mu\text{m}$ resolution)
- Robust (IP67 and 0 to 70 °C operating temperature range)



LMI110

- Open measuring system
- No wear
- Ideal for applications with high dynamic range (up to 20 m/s)
- High precision ($\pm 5 \mu\text{m/m}$)
- Suited for long travel (up to 30 m)
- Available with 1Vpp or TTL (down to $0.125 \mu\text{m}$ resolution)
- Robust (IP67 and 0 to 70 °C operating temperature range)
- Integrated electronics



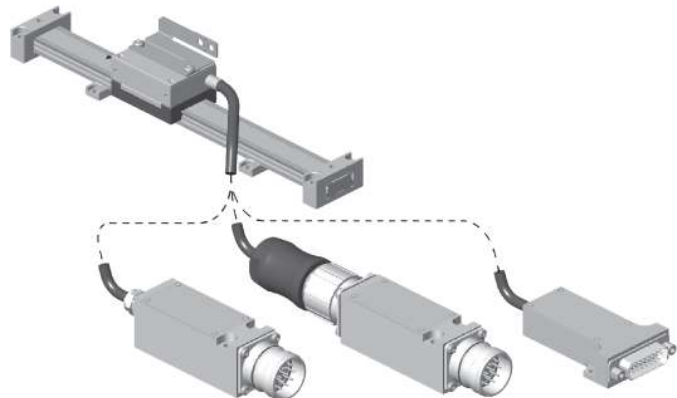
LMI130

- Open measuring system
- No wear
- Wide mounting tolerance
- Ideal for applications with high dynamic range (up to 30 m/s)
- High precision ($\pm 10 \mu\text{m}/\text{m}$)
- Suited for long travel (up to 60 m)
- Available with 1Vpp or TTL (down to $0.75 \mu\text{m}$ resolution)
- Robust (IP67 and 0 to 70 °C operating temperature range)
- Integrated electronics



LMI200

- Miniature measuring rail
- Miniature measuring slider with connector electronics
- Stainless-steel version
- Ideal for tough environment
- High precision ($\pm 5 \mu\text{m}/\text{m}$)
- Available with 1Vpp or TTL (down to $0.125 \mu\text{m}$ resolution)
- Robust (IP67 and 0 to 70 °C operating temperature range)
- Large mounting tolerances of $\pm 1 \text{ mm}$ over flexure element



LMI300

- Robust mechanical design
- Integrated electronics
- Ideal for tough environment and long measuring lengths (single or multiple sections)
- High precision ($\pm 5 \mu\text{m}/\text{m}$)
- Easy mounting and large mounting tolerances of $\pm 1 \text{ mm}$ over flexure element
- Available with 1Vpp or TTL (down to $0.125 \mu\text{m}$ resolution)
- Robust (IP67 and 0 to 70 °C operating temperature range)



WMI100

- Open measuring system
- Miniature design with connector electronics
- No wear
- Available with flange or ring
- Various diameters, starting at 80mm
- Ideal for applications with high dynamic range (up to 23,000 rpm)
- High precision ($\pm 5 \mu\text{m-arc}$)
- Available with 1Vpp or TTL (down to $0.125 \mu\text{m-arc}$ resolution)
- Robust (IP67 and -10 to $100 \text{ }^\circ\text{C}$ operating temperature range)



WMI200

- Open measuring system
- Integrated electronics
- No wear
- Available with flange or ring
- Various diameters, starting at 80mm
- Ideal for applications with high dynamic range (up to 23,000 rpm)
- High precision ($\pm 5 \mu\text{m-arc}$)
- Available with 1Vpp or TTL (down to $0.125 \mu\text{m-arc}$ resolution)
- Robust (IP67 and -10 to $100 \text{ }^\circ\text{C}$ operating temperature range)



WMI300

- Open measuring system
- Integrated electronics
- No wear
- Available with flange or ring
- Various diameters, starting at 80mm
- Ideal for applications with high dynamic range (up to 70,000 rpm)
- High precision ($\pm 10 \mu\text{m-arc}$)
- Available with 1Vpp or TTL (down to $0.75 \mu\text{m-arc}$ resolution)
- Robust (IP67 and -10 to $100 \text{ }^\circ\text{C}$ operating temperature range)



WMI110

- Open measuring system
- Miniature design with connector electronics
- No wear
- Inside scanning
- Various diameters, starting at 160mm
- Ideal for applications with high dynamic range (up to 23,000 rpm)
- High precision ($\pm 5 \mu\text{m-arc}$)
- Available with 1Vpp or TTL (down to $0.125 \mu\text{m-arc}$ resolution)
- Robust (IP67 and -10 to $100 \text{ }^\circ\text{C}$ operating temperature range)



WMI210

- Open measuring system
- Integrated electronics
- No wear
- Inside scanning
- Various diameters, starting at 160mm
- Ideal for applications with high dynamic range (up to 23,000 rpm)
- High precision ($\pm 5 \mu\text{m-arc}$)
- Available with 1Vpp or TTL (down to $0.125 \mu\text{m-arc}$ resolution)
- Robust (IP67 and -10 to $100 \text{ }^\circ\text{C}$ operating temperature range)



WMI310

- Open measuring system
- Integrated electronics
- No wear
- Inside scanning
- Various diameters, starting at 160mm
- Ideal for applications with high dynamic range (up to 70,000 rpm)
- High precision ($\pm 10 \mu\text{m-arc}$)
- Available with 1Vpp or TTL (down to $0.75 \mu\text{m-arc}$ resolution)
- Robust (IP67 and -10 to $100 \text{ }^\circ\text{C}$ operating temperature range)



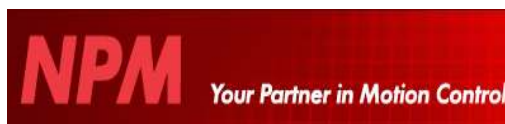
For more information about any of the above topics or general questions or comments, please contact us:



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Motion Designs is a technical sales and engineering company with extensive machine and motion control experience. We work with some of the best manufacturers in the industry as witnessed by our present line card:

- www.amosin.com: AMO manufactures induction based precision linear and angle measurement encoders.
- www.arcus-technology.com: Arcus Technology manufactures stepper motor, drive and controller technology, providing USB, Ethernet and Mod-Bus connectivity.
- www.nipponpulse.com: Nippon Pulse manufactures the unique linear shaft motor, a direct drive linear brushless servo motor.
- www.shinano.com: Shinano Kenshi manufactures cost effective brushless servo motors and assemblies.
- www.stegmann.com: Stegmann is a leader in high performance motor feedback solutions.
- www.technosoftmotion.com: TSM is a leading DSP motion control technology company specialized in the development, design and manufacture of digital motor drive products and custom motion systems.



T E C H N O S O F T
M O T I O N T E C H N O L O G Y