# +++ Press Release +++

**Wiegand Sensors - Proximity Sensing with Extra Powers**

**Hamilton, New Jersey, December 2020** – Wiegand sensors – tiny devices that use variations in an external magnetic field to generate electrical signals and energy – have unique properties that make them a useful option for proximity sensing systems.

Wiegand sensors are built around small sections of Wiegand wire, a specially prepared ferromagnetic alloy that has a unique physical property. When exposed to an alternating external magnetic field, a Wiegand wire will initially retaining its magnetic polarity. However, when the external field reaches a certain threshold, the polarity of the wire segment will abruptly reverse. This polarity switch occurs within a few microseconds and can generate a distinct current pulse in a fine copper coil wrapped around the ferromagnetic core. This pulse is strong enough to activate logic circuits and can be used to energize low power electronic chips. This self-powering capacity of Wiegand sensors helps make them more reliable – and safer – since they can provide signals for alarm systems without external power sources. There is no need to check or replace backup batteries, sharply reducing maintenance requirements!

Wiegand sensors have been used for proximity sensing in several ways. If the external object is magnetized, or has one or more small permanent magnets mounted on it, then the Wiegand sensor will respond when the object comes close enough to trigger a polarity reversal. This can be used to detect and measure linear or rotary motions. Alternatively, the Wiegand sensor can be mounted between a set of permanent magnets. When an iron or steel object come close enough, it will have the effect of distorting the magnetic field immediately around the Wiegand sensor enough to trigger a polarity flip and generate a current pulse.

**Advantages of Wiegand sensors:** Wiegand sensors are intrinsically safe, since their self-powered characteristics mean that they can function without external power sources. There is no mechanical contact between the source of the alternating magnetic field and the Wiegand wire assembly and no wear. Wiegand systems will function reliably for billions of cycles. The sensors are physically rugged, can operate over a wide range of temperatures. They are also insensitive to electrical noise. Response is consistent over a frequency range of near-zero to well over 30kHz.

POSITAL offers Wigand sensors in package form, consisting of a 15 mm length of Wiegand wire surrounded by a copper coil, all contained in an SMD-mountable plastic support structure.

**About FRABA and POSITAL**

POSITAL is a supplier of advanced industrial position sensors used in a wide variety of motion control and safety systems. The company is also an innovator in product design and manufacturing processes and a pioneer of Industry 4.0 (Industrial Internet of Things/IIoT), offering customers the benefits of built-to-order products combined with the price advantages of mass-production. POSITAL is a member of the international FRABA group, whose history dates back to 1918, when its predecessor, **Fr**anz **Ba**umgartner elektrische Apparate GmbH, was established in Cologne, Germany to manufacture relays. Since then, the company has played a trendsetting role in the development of rotary encoders, inclinometers and other sensor products. POSITAL has a global reach with subsidiaries in Europe, North America and Asia – and sales and distribution partners around the world.

Press Photos (two images attached– both in JPEG format):

#1: Wiegand Sensor: The heart of the Wiegand Sensor is the specially conditioned ferromagnetic Wiegand Wire, which is embedded in a fine copper coil. Changes in an external magnetic field are used to generate electrical impulses or energy.

#2: Intrinsically safe pulse generator: As proximity switches, Wiegand Sensors react to changes in the local magnetic field caused by changes in the position of nearby objects. These trigger sudden polarity reversals in the core of the Wiegand Wire, generating clearly defined current pulses. Linear or rotary motions can be precisely detected and measured.

###### Further Information

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