



Absolute encoders for the brushless DC motors in WITTENSTEIN cyber motor's cyber dynamic line

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Miniature multiturn without a battery and gearhead

Thanks to WITTENSTEIN cyber motor's "cyber dynamic line", size 32 and 40 industry-standard brushless DC motors with a miniature multiturn encoder are now available for the first time without a battery and gearhead. Precise and reliable solutions for complex motion tasks – where single-turn encoders come up against their limits – can in future be realized in an extremely small space envelope. With its miniaturized multiturn functionality, the cyber dynamic line is perfect for a broad array of applications in filling and packaging machines, food processing and automated handling processes with pick & place robots or grippers.

High-tech products made by WITTENSTEIN fly into space and win Formula One races. Intelligent drive systems – from the world's smallest high-performance servo drive to the latest state of the art in medical technology – are developed, produced and marketed by a team of around 1900 employees. With a blend of dedication and enthusiasm, we set benchmarks – every day – worldwide.



Miniaturization, decentralization, productivity, precision, connectivity – all of these requirements are fulfilled by every brushless DC motor in the cyber dynamic line, which comprises size 17, 22, 32 and 40 models (outer diameter in millimetres) for output ratings from 25 W to 335 W in high quality, easy-to-clean stainless steel housings which are suitable for hygienic production. The new, miniature multiturn functionality for sizes 32 and 40 provides significantly more possibilities when it comes to realizing complex motion and positioning tasks for a variety of machine processes.

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Energy harvesting: multiturn encoders as nano generators

The innovative heart of the new and highly compact absolute encoders integrated in the brushless DC motors lies in the Wiegand effect which is used to achieve the multiturn functionality. This energy harvesting technology enables tiny amounts of electrical energy to be produced from the motion of the drive itself. As the motor shaft turns, the Wiegand sensor acts as a nano generator which responds to the changing magnetic field. It generates both the count pulses for the turns completed so far and the electrical energy needed to process the signals and write them to non-volatile memory by flipping the magnetic state of its soft core.

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Compelling arguments for integration in brushless DC motors

As a result of the Wiegand principle, it is possible to realize the multiturn functionality without either a micro gearhead or a back-up battery – both of which have a finite lifetime and therefore also limit the operating life of the drives. The mechanics are completely wear-free even at high speeds or in applications where frequent starts and stops are the norm. The magnetic sensing principle is just as robust as the mechanical design of the miniature encoders: their durability – and with it the long-term performance of the motors – is unaffected by shocks, vibration and temperatures up to 125°C, which are not uncommon when the brushless DC motors are in operation. The huge miniaturization of the encoders is likewise a great advantage: their diameter is twenty percent smaller than the market standard while the axial height is less than half.

Innovative encoder concept drives brushless DC motors to "new" performance

The cyber dynamic line is the first series of industry-standard brushless DC motors in which sizes 32 and 40 provide contactless, wear-free and energy-autonomous multiturn functionality. The count pulses are counted independently of the speed of the rotary motion, in other words they are generated and counted as an absolute number even at very low speeds. It is no longer necessary to search for a reference position when a machine is started up after servicing, a power failure or an emergency stop, even if the motor has been adjusted. A turned axis is detected and counted even if the controller is switched off. cyber dynamic drives thus guarantee much higher processing reliability and availability than motors with single-turn or incremental encoders. From now on, they can also be positioned even more accurately – thanks to the 14-bit resolution in the case of single-turn or 16-bit with multiturn.

The hybrid single-cable technology chosen for the encoders and the digital BISS C interface mean optimal electrical connectivity: information is transferred reliably in real time and in high resolution even with dynamic, high speed processes. Furthermore, in combination with WITTENSTEIN motion control's simco drive servo amplifier, the electronic nameplate installed in the encoder allows automated setting of the controller parameters – for an intelligent, integrated, brushless DC motor system featuring a high level of motor and amplifier usability. The system supports various bus

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systems including Profinet IRT, EtherCat and CANopen, and is designed for easy integration into existing automation solutions.

Photos:

1. Thanks to WITTENSTEIN cyber motor's "cyber dynamic line", size 17, 22, 32 and 40 industry-standard brushless DC motors are now available for the first time for output ratings from 25 W to 335 W.
2. The industry-standard brushless DC motors in stainless steel design provide contactless, wear-free and energy-autonomous multiturn functionality in an extremely small space envelope. It is no longer necessary to search for a reference position, even if the motor was adjusted while deenergized.
3. Owing to the integrated miniature multiturn encoder, these industry-standard brushless DC motors provide significantly more possibilities when it comes to realizing complex motion and positioning tasks – while dispensing completely with a battery and gearhead.

Texts and photographs in printable quality can be downloaded from presse.wittenstein.de.

WITTENSTEIN AG – one with the future

With around 1900 employees worldwide and sales of approximately €276 million in 2014/15, WITTENSTEIN AG enjoys an impeccable reputation for innovation, precision and excellence in the field of mechatronic drive technology – not just in Germany but internationally. The group comprises eight pacesetting Business Units with separate subsidiaries for servo gearheads, servo actuator systems, medical technology, miniature servo units, innovative gearing technology, rotary and linear actuator systems, nano technology and electronic and software components for drive technologies. Through its 60 or so subsidiaries and agents in approximately 40 countries, WITTENSTEIN (www.wittenstein.de) is additionally represented in all the world's major technology and sales markets.

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