



WITTENSTEIN alpha: Innovation sets standards

Essential performance values of LP⁺ Generation 3 low-backlash planetary gearhead revised

By Thomas Krämer, Product Manager at WITTENSTEIN alpha GmbH, Igersheim

There is an increasing demand for machinery and plant that needs less energy and makes less noise. Amongst other things, manufacturers of handling systems and packaging machines, for instance, are casting a watchful eye on the drive technology. The third generation of WITTENSTEIN alpha's LP⁺ planetary gearhead series heralds the advent of even more powerful drive solutions that will also arouse interest owing to their significantly reduced noise emissions.

Innovations are driven by market and user needs. Noise reduction, highest power density and energy efficiency are the three main trends today. WITTENSTEIN alpha responded the requirements of the market with the third generation of its LP⁺ gearhead family.

The LP series was originally launched in the market back in 1996 as a robust and economical planetary gearhead. As the first gearhead in this performance class, it established WITTENSTEIN alpha as innovation leader from the outset. The huge success of the series as a versatile performer led to the LP⁺ upgrade in 2004 with significantly improved characteristics. The LP⁺ Generation 3 represents yet another milestone in gearhead development for WITTENSTEIN alpha. LP⁺ Generation 3 extends the product portfolio, providing designers of feed axes, handling systems, packaging machines and industrial machinery in general with multiple technical and economic benefits.

Improved performance as the key to downsizing

New design and machining processes have enabled an impressive performance leap to be realized with the LP⁺ Generation 3. The transmittable torques are now up to 75% higher than the industry

April 24, 2012

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 1.400 employees. With a blend of dedication and enthusiasm, we set benchmarks – every day – worldwide.



WITTENSTEIN alpha's LP⁺ Generation 3

WITTENSTEIN AG

Walter-Wittenstein-Straße 1
97999 Igersheim · Germany

Contact: Sabine Maier
Press Officer
Tel. +49 7931 493-10399
Fax +49 7931 493-10301
E-Mail: sabine.maier@wittenstein.de
www.wittenstein.de

standard and several new reduction ratio steps have been added to the portfolio. As a result, the selection process for the corresponding applications of the new planetary gearheads is now even more flexible. At the same time, the enhanced performance of the LP⁺ Generation 3 gearheads may open up important downsizing options for users. Owing to the clear improvements incorporated into this latest generation, downsizing will in future be a viable option in many applications where it was previously impossible to leverage the maximum transmissible torque. If the application features on-board drives, downsizing additionally improves energy efficiency. By choosing a smaller size, the mass to be accelerated can be halved without compromising the drive's output – and energy consumption is accordingly lower. On top of this, a more compact drive takes up less space in the application. Downsizing is also a good way to bring down the noise level. If it is possible to manage with the T_{2N} torque of 28.5 Nm that is achieved with the new LP⁺ Generation 3 gearhead in the 070 size, for instance, rather than the 40 Nm required by the equivalent "old" size 090, the noise produced by the application can be reduced from 72 dB (A) to 64 dB (A) – less than half the audible volume.

Quieter drive with half the noise

However, "less noise" was not intended to be solely the outcome of downsizing: on the contrary, it was a separate development objective of the LP⁺ Generation 3 series in its own right. The operating noise has been significantly reduced thanks to the optimized manufacturing and finishing processes for the gearing parts and the improvements to the tooth flank geometry. The third generation of the LP⁺ is 6 dB (A) quieter on average than the old LP⁺ series, in other words the noise level has been more than halved. Two new LP⁺ Generation 3 gearheads, for example, produce less operating noise than a single LP⁺ gearhead in the predecessor generation. Laboratory measurements on the gearhead revealed a noise level between 60 and 65 dB (A), depending on the design and size. This noise reduction by the LP⁺ Generation 3 series is greatly appreciated by users of packaging machines and handling systems because it is achieved without any additional acoustic enclosure on the gearhead side or noise abatement measures in the periphery.

Less torsional backlash means more precision

WITTENSTEIN AGWalter-Wittenstein-Straße 1
97999 Igersheim · Germany**Contact: Sabine Maier**
Press Officer
Tel. +49 7931 493-10399
Fax +49 7931 493-10301
E-Mail: sabine.maier@wittenstein.de
www.wittenstein.de

However, LP⁺ Generation 3 is not only more powerful and quieter but also more precise. The torsional backlash, for instance, is far less than with the predecessor series. Whereas the "old" LP⁺ was already very precise for its class with a maximum of 15 arcmin (size 090, 2-stage), LP⁺ Generation 3 goes a step further. The 090 size has a maximum torsional backlash of just 10 arcmin with a 2-stage reduction ratio. LP⁺ Generation 3 is consequently ideal for servo applications where highly precise positioning is a must. The output can optionally be designed with a smooth or slotted shaft. The gearhead can also be supplied with a flanged output in the LPB⁺ Generation 3 version if this is required by the application. Special integrated, space-saving belt pulley solutions permit further refinements to the design of timing belt applications.

speedline[®] service assured

The development of the new LP⁺ Generation 3 was a holistic process: the goal was not simply to come up with technical improvements but also to examine ways to optimize the production and assembly workflows in order to reduce shipping times to a minimum and maximize delivery reliability. Minimal standard delivery times and the WITTENSTEIN alpha express speedline[®] delivery service are also guaranteed for the new series. Customers planning to install the LP⁺ Generation 3 in their machines are not forced to accept unnecessary delays. Modernization projects are likewise supported: the LP⁺ and the new LP⁺ Generation 3 have identical connection geometries and the two gearheads are fully interchangeable.

From noise reduction through energy efficiency to downsizing – thanks to its manifold innovations, the new LP⁺ Generation 3 series sets new performance benchmarks in its class.

Captions:

Photo 1: Author of the report: Thomas Krämer, Product Manager at WITTENSTEIN alpha GmbH, Igersheim

WITTENSTEIN AG

Walter-Wittenstein-Straße 1
97999 Igersheim · Germany

Contact: Sabine Maier
Press Officer
Tel. +49 7931 493-10399
Fax +49 7931 493-10301
E-Mail: sabine.maier@wittenstein.de
www.wittenstein.de

Photo 2: From noise reduction through energy efficiency to downsizing – thanks to its manifold innovations, the new LP⁺ Generation 3 series sets new performance benchmarks in its class.

Photo 3: With its compact design, the LPB⁺ Generation 3 with flanged output is also suitable for applications where size is a critical aspect.

Photo 4: Regardless of their size, all gearheads in the LP⁺ Generation 3 series produce significantly less operating noise.

Photo 5: More torque is now transmitted torque with all sizes and all reduction ratios.

Texts and photographs in printable quality can be downloaded from <http://www.wittenstein.de/presse.html>.

WITTENSTEIN AG – being one with the future

With around 1400 employees worldwide and sales of €197 million in 2010/11, 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.

WITTENSTEIN AG

Walter-Wittenstein-Straße 1
97999 Igersheim · Germany

Contact: Sabine Maier
Press Officer
Tel. +49 7931 493-10399
Fax +49 7931 493-10301
E-Mail: sabine.maier@wittenstein.de
www.wittenstein.de