

Strictly electrical movement of large loads

The alternative to conventional hydraulic systems: the environmentally-friendly and highly efficient Movotec Spindle Motor System (SMS) from SUSPA

Around 30 sectors with more than 1200 applications rely on gas struts, dampers, adjustment, crash and safety systems from SUSPA GmbH, headquartered in Altdorf near Nürnberg. Part of their portfolio is the Movotec system for continuously variable hydraulic height adjustment of loads, which has already been proven in use for decades, now has competition from within the company: The new mechatronic Movotec Spindle Motor System (SMS) combines the advantages of proven technology in terms of power and reliability with those of a conventional electric spindle drive. This opens up a variety of applications in which ergonomic aspects are a priority.

The established Movotec system from SUSPA is primarily used in industrial applications, whether for workbenches, conveyor belts and work station systems, for kitchen components or sales and service facilities for retail and wholesale. With this system, mobile home beds are also adjusted vertically with these systems and fish counters are tilted mechanically for cleaning purposes. The method of operation has always been the same: A hydraulic pump, operated by hand or an electric motor, forces hydraulic oil into a connected cylinder and moves it up and down within the desired range. However, installing this type of pump with the appropriate lines costs time and requires space. Moreover, if a hose is damaged, leaks and slipping hazards can result. In addition, the object to be raised must have a certain weight (resetting force) so that the hydraulic oil can be forced back into the pump when lowering. With the spindle drive, on the other hand, an active movement in both directions replaces the one-dimensional effect of the object weight.

Loads of up to 150 kg in the push direction and 75 kg in the pull direction are possible

The new Movotec Spindle Motor System (SMS) does not use any hydraulic oil and makes space-consuming pumps and hoses unnecessary. A central control unit with very low standby current consumption drives the lifting elements. Each lifting element enables loads of up to 150 kg in the push direction and 75 kg in the pull direction and is ideally suited for countless applications with its sophisticated design (the housing diameter of the lifting elements is only 3.5 cm) and simple assembly. Because the hole

pattern for the screws is identical, originally installed Movotec systems can be replaced quickly and easily with the new-height adjustment system. Hydraulic systems from competitors can also be replaced easily with the new SMS.

Reversible brake prevents lowering

SUSPA also applied its expertise in the development and production of active automotive spoilers in the Movotec electro-mechanically-based innovation. "The tricky part was incorporating all components in a minimal installation space. We had to integrate small, extremely powerful motors and very slim, but sturdy lifting elements into a profile with an outside diameter of only 35 millimeters. The power density of the SMS is truly unique. A wrap spring brake was also integrated. It is direction-dependent and prevents the lifting leg from lowering if the power is cut off," explained Andreas Strobel, Director of Marketing and Sales of Mechanical Applications at SUSPA. If a component is damaged, it only takes a few minutes to replace a lifting leg. Soiling from oil, refilling and subsequent bleeding of the overall system are no longer a problem with SMS.

Lifting force of up to 1.2 tons

Each of the actuators lifts up to 150 kilograms with a lifting speed of approx. 8 mm/s and a maximum extension force of a four-leg standard system is 600 kg. If this value is not sufficient for a specific application, two systems can be connected in a series. Then apparatuses with a total weight of up to 1.2 tons can be lifted. Two control units are required for this purpose. They each have five channels (four for the lifting elements, one for the manual switch / the link cable) and synchronize the individual legs. Hall sensors monitor the motor speed during the process. A master manual switch enables continuously variable height adjustment with millimeter precision.

The compact Movotec Spindle Motor System can be easily integrated into existing production and assembly lines and it is advisable, because it is a cleaner solution than the hydraulic system from an environmental perspective, according to Andreas Strobel. It can be installed wherever ergonomics is of high importance. In conveyor and assembly belts, which are often used in shift operation, it was previously not possible to adjust the working height to some extent due the massive structural design in most cases. This is where the Movotec SMS comes in: Individual optimal settings for body sizes can be saved for up to three persons with a memory button. This applies to assembly and sales and service desks in retail and wholesale, food service and hotels. Even kitchen work surfaces and wash basins, office, sewing and packing tables can be appropriately retrofitted. The system is available in four sizes with stroke lengths of 150, 200, 300 or 400 millimeters. With the 300 series, an

object can be lifted a maximum of 300 mm (from 635 to 935 mm); with the 400 series, it can be lifted up to 400 mm.

New technology will replace conventional hydraulic systems

Andreas Strobel is certain: "Our Movotec system has been an established brand for a long time. In the meantime, small installation spaces for height adjustment systems are in greater demand than ever before. The trend for work benches continues towards slimming with a simultaneously visually appealing design. Therefore, modern height adjustment systems like the SMS will successively replace conventional hydraulic systems or excessively large spindle systems. It all comes down to power density and simple handling."

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The electromechanical Spindle Motor System from SUSPA was specially design for lifting loads and works with a supply voltage of 230 V (50 Hz/2.7A) and/or and output voltage of 28 VDC 345 VA (10 percent duty cycle). A system consists of one or two control units and up to eight lifting elements comprising a DC electric motor with connected spindle gear unit and the spindles (referred to as actuators). They implement the electrical signals sent from the control computer as mechanical movements. In each lifting element, which has a profile of only 35 mm, accommodates DC electric motor with an extremely quiet gear unit which turns a spindle that is also inside the lifting element. The rotational movement moves the non-rotating spindle nut axially. It is connected directly to the aluminum outer tube, which can retract and extend 15 to 40 cm with each stroke.