



## Haptic sensors from Resense: Sense of touch for medical, service and industrial robots

**Resense GmbH of Klingenberg, Bavaria – a joint venture between WIKA Alexander Wiegand and WITTENSTEIN – will be taking advantage of the upcoming Hannover Messe to demonstrate the world’s smallest six-axis force / torque sensors for the industrial market, which have a diameter of just 8.4 mm.**

The miniaturized hollow-shaft design for cable and conductor feedthroughs make the haptic sensors particularly easy to integrate. With their high sample rate and resolution, they give robotic systems in medical and surgical applications or assembly and handling technology a keen sense of touch: a change in mass of as little as one gram, for example when manipulating sensitive components, can now be reliably detected.

These innovative haptic sensors with a hollow shaft will be on show at the WITTENSTEIN booth as a complete product portfolio in various sizes, both integrated into application models of robotic hands and medical instruments and as a live demo in a 6D haptic simulator.

### **Precise measurement, perfect integration**

The 6-axis force / torque (F/T) sensors in Resense’s HEX product family, which offer a sample rate of 1 kHz and 10-bit resolution, measure changes in mass in the three translational and rotational spatial directions with the help of integrated strain gauges. The analog voltage signals produced in this way are converted to forces and torques in a compact, external electronics box.

The sensor data can be visualized and recorded in real time, then exported to a control system or application as measured values. Lead customers in industry and university research, in the field of robot-assisted surgery among others, praise the miniaturized hollow-shaft design and the measurement accuracy – features that ensure a high degree of adaptability to the application as well as optimum integration.

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WITTENSTEIN SE develops products, systems and solutions for highly dynamic motion, maximum-precise positioning and smart networking for mechatronic and cybertronic drive technology.



Haptic sensors from Resense

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**Haptic sensors from Resense:  
Helping to shape future human-robot interaction**

Robots integrated into human environments need humanoid capabilities. Resense sensors give robots a special sense of touch, enabling a new era of empathetic human-robot interaction while increasing performance, safety, and precision in areas such as medical, service and industrial robotics.

**Positive verdict on the first twelve months:  
Resense successfully combines expertise from WIKA and  
WITTENSTEIN**

Resense was set up in April 2023 as a joint venture between WIKA and WITTENSTEIN with the aim of carving out a leading role for itself at an early stage in the future market for haptic sensors. The two partners each hold 50 percent of the shares. Resense has now closed its first fiscal year with a better-than-planned result.

In terms of products, the joint venture is based on the miniaturized hollow-shaft multi-axis sensors developed by a WITTENSTEIN startup for highly precise measurement of forces and torques in confined spaces. As a leading producer of pressure and temperature measuring equipment, WIKA contributes high-tech manufacturing expertise in sensor and chip components.

Developers from Resense and WIKA are working together to develop pioneering processes and technologies, for instance for glass-soldering the novel silicon chips onto the sensor deformation body, bonding hair-thin aluminum wires between chip pads and flexible conductors or laser welding the titanium geometry. The start of production and certification of the sensor technology were initiated in 2023 with the goal of producing large quantities for the industrial market in the near future.

**Pictures:** (Source WITTENSTEIN SE)

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### **01-wittenstein-resense**

The miniaturized hollow-shaft design make Resense's F/T sensors unique for customers.



### **02-wittenstein-resense**

The new, miniaturized electronics box



### **03-wittenstein-resense**

The Resense logo

Texts and photographs in printable quality can be downloaded from  
<https://www.wittenstein.de/en-en/company/press/>

### **Resense – A Sense of Touch**

Resense GmbH is a joint venture between mechatronics corporation WITTENSTEIN and measurement equipment specialist WIKA Alexander Wiegand SE & Co. KG. The miniaturized 6-axis force / torque sensors provide machines with a sense of touch – with applications in medical technology as well as service and industrial robotics.

### **WITTENSTEIN – one with the future**

With around 2900 employees worldwide and sales of €519 million in 2022/23, WITTENSTEIN SE enjoys an impeccable reputation for innovation, precision and excellence in the field of cybertronic motion – not just in Germany but internationally. The group possesses exceptional expertise for the mastery and further development of all technologies relevant to mechatronic drives and comprises six innovative Strategic Business Divisions. We develop, produce and sell products such as high-precision servo drives and linear systems, servo systems and motors as well as cybertronic drive systems for many areas of application including machine and plant construction, aerospace or oil and gas exploration.

Nanotechnology and software components round off the portfolio. With 25 sites in more than 45 countries, the WITTENSTEIN group ([www.wittenstein.de](http://www.wittenstein.de)) is represented in all major technology and sales markets.

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