



TrueSafety: TÜV certification for redundant force sensors of Hirschmann MCS

(Mynewsdesk) Just to make sure: The Southern German Technical Inspection Association (TÜV Süd) confirms the safe handling of overloads without impairment of sensors by fSENS force sensors. The complete TrueSafety certification includes the standard models of the redundant measuring axis fSENS MA, the tension load cell fSENS DKA and the annular compressive force transducer fSENS RDKA.

In order to ensure higher security demands in mobile cranes and elevating work platforms, Hirschmann MCS has designed the fSENS force sensors redundantly, and thus ensure a higher availability of the sensors. In the following interview, Hirschmann MCS certification expert Dr Martin Weis answers all relevant questions on the TÜV certification of fSENS force sensors.

CU: Mr Weis, which TÜV certification have fSENS force sensors received?

Dr Weis: We have received the complete SIL2/PL d certification for the redundant standard current sensors of measuring axes fSENS MA, of compressive force transducers fSENS DKA as well as fSENS RDKA. This means that they meet the safety requirements of EN ISO 13849 and EN 61508. The new thing is that compared to the "simple" force sensors the fSENS force sensors have an even higher accuracy as well as EMC protection at an input voltage of 10 … 30 V. In addition, they have a guaranteed zero point stability.

CU: What are the advantages for the users?

Dr Weis: In redundant operation, the failure probability for random errors is reduced. There are two possibilities of establishing the functional safety of SIL2 devices: either by redundancy or by the use of built-in diagnosis functions. We have decided in favour of the first possibility as a higher availability can be established with redundant sensors, and compared to diagnosing systems still have a signal we can rely on in case of failure.

CU: What does the TÜV certification comprise?

Dr Weis: The TÜV certification establishes the safe handling of overloads without affecting the sensor. Compared to other suppliers Hirschmann MCS had not only the electronics of the sensors tested, but also the construction and bonding. All-in-all, the development, calculation and production process, the material, the redundancy, the mechanical system and construction, the quality management as well as the service of Hirschmann MCS has been certified. We do not deliver anything that is not safe!

CU: Where are these redundant force sensors used?

Dr Weis: Wherever highest safety requirements are needed, for example in mobile cranes, such as lattice boom cranes and telescopic cranes, vehicle cranes, portal and harbour cranes as well as in elevating work platforms. In keeping with ISO 4301, the load range class A5 is applicable (ISO 4301 KL A5). The mechanical construction of the force sensors has been calculated at ten years - thus the typical service life of a harbour crane. During the calculation, 500,000 load changes with a typical load have been taken into consideration.

CU: How do you evaluate the quality and robustness of the force sensors?

Dr Weis: An improved quality is guaranteed for sensors. The safe failure fraction is 99.5 percent, which means that this quota of faults is discovered. This is a clear competitive advantage as well. In addition, the steel and O ring seals ensure perfect protection against humidity. With the sensor body made of high-quality steel, we guarantee absolute resistance. The sensors are extremely robust: They have been tested in conformity with the stipulations of DIN standard EN 60721 for shock and vibration resistance according to class 5M3. This includes, for example, 100 shocks per direction of up to 1,000 m/s². In addition, IP protection class IP66/67 is observed.

CU: Could other impairments be caused by interfering energy, for example?

Dr Weis: No, because compared to previous fSENS force sensors the new ones have improved amplifier electronics. They convince by a high degree of electromagnetic immunity, i.e. electromagnetic compatibility. This means that fSENS sensor amplifier is not affected by a large amount of interfering energy.

CU: A glance at the MTTFd values is interesting as well.

Dr Weis: This is correct. This safety figure describes the average service life up to failure, and on account of EN 13849-1 has achieved a new significance as it is used to assess the machine safety. The MTTF-d value for Hirschmann force sensors is 899 years for redundant sensors.

CU: How fast and how precise to the sensors operate?

Dr Weis: fSENS force sensors score with a safety reaction time of less than 30 milliseconds. Thus, less than 30 milliseconds occur between occurrence to signalling of a fault. This is another advantage compared to diagnosis systems. Even under the influence of electromagnetic disturbances, a high accuracy is observed across the entire voltage range from 10 … 30 V.

We are convinced that we can guarantee our customers highest quality standards with the integrated certification of our force sensors.

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Hirschmann Mobile Machine Control Solutions (MCS) is a business unit of Hirschmann Automation and Control GmbH and a brand of U.S.-based Belden Inc.

Hirschmann MCS is the world market leader in safe load indication for telescopic and lattice-boom cranes and a specialist in robust controllers for mobile machines. As one of the leading systems suppliers, the company sets standards in innovative automation platforms for mobile applications in harsh environments.

Drawing on expertise and experience gained during more than 40 years, the team of Hirschmann MCS enables communication between people and machines.

450 employees develop, optimize, and produce product and system solutions at three locations in Germany, the United States, and China. These include software and hardware for sensors, controllers, and consoles for mobile machines and applications.

As a reliable, innovative, and flexible provider of leading-edge technology, high-quality products, and first-rate services, Hirschmann MCS is committed to ensuring that today's components and solutions already comply with tomorrow's specific safety requirements and generally valid standards.