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Press release

Wheel torque transducer (WTT) series RoaDyn P1 – the new standard for vehicle dynamics and driving resistance measurements

Targeted enhancements to the RoaDyn P1ST/MT/HT wheel torque transducer series take performance and efficiency testing for commercial vehicles to a new level.

Winterthur, June 2026

Vehicle dynamics and driving resistance measurements are not only of great importance in the field of research and development. Commercial vehicles must meet a specified CO_2 emission standard for registration in the European Union. A wide range of factors must be considered when determining emission levels, including the mandatory measurement of traction torque. With the RoaDyn P1 wheel torque transducer (WTT) series, which is available for light commercial vehicles (small trucks) (ST), medium trucks (MT) and heavy trucks (HT), Kistler makes a valuable and indispensable contribution here.

The RoaDyn P1HT wheel torque transducer is designed for heavy-duty vehicles (HDV) and has a measuring range of 50,000 N·m (high range) or 5,000 N·m (low range); it has been an integral part of the research and development for trucks and buses for several years. The RoaDyn P1(ST/MT/HT) wheel torque transducer has now undergone a fundamental redesign and significant modifications, resulting in even greater reliability and longer service life. The torque wheel is also available for light commercial vehicles and medium trucks and buses in the appropriate configuration and measuring range.

Six piezoelectric single-component precision load cells, each containing two piezo force sensors, are installed in a P1HT torque wheel. The force sensors have been optimized, the cabling of the load cells simplified and the housing's protection against the effects of weather, dirt and corrosion has been improved. All measures are based on practical experience and the industry's ever-increasing demands.

Existing wheel torque transducers can be upgraded thanks to their modular design

The further development of the RoaDyn P1ST/MT/HT wheel torque transducers has been designed so that existing torque wheels can be upgraded with the new components. Users can rely on maximum compatibility. Existing customers do not need to replace the entire wheel force transducer. The load cells currently installed will simply be replaced with the new components and optimized cabling; no reconfiguration is required. Kistler offers its customers the upgrade as a special service, thereby

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ensuring maximum sustainability and investment protection. A less complex design not only increases reliability and service life, customers also benefit from lower costs compared to a completely new investment. Effective immediately, only the advanced technology will be used.

Focusing on rolling resistance measurements according to the EU CO_2 Emission Regulation

In addition to typical applications such as research and development in the field of dynamic control systems, determining powertrain efficiency, measuring vehicle performance or analyzing fading effects in brakes, the wheel torque transducer is a key component in determining the CO_2 emissions of light, medium and heavy-duty commercial vehicles. Since 2025, stricter guideline values have applied to commercial vehicles over 3.5 tons on the basis of the EU's CO_2 Emissions Regulation, which will be further tightened in a next step in 2030. To determine the CO_2 emissions, measured values for air resistance (Cd x A), the rolling resistance coefficient (RRC), engine performance maps, transmission and powertrain characteristics as well as axle and rotational inertia are recorded.

Within these measurements, the determination of the operating loads of a vehicle acting on a wheel torque transducer such as the RoaDyn P1ST/-MT/-HT while driving is of great importance. Finally, the CO_2 emissions are calculated from the measured values using the EU's standardized "VECTO" (Vehicle Energy Consumption Calculation Tool) calculation model. Manufacturers have a strong interest in component testing, as the precise measurements often yield values that exceed the standard values that would otherwise be used. The RoaDyn P1ST/MT/HT wheel torque transducers are the manufacturers' preferred choice for these mandatory tests. In contrast to other technological approaches, they do not require complex brackets on the outside of the vehicle body, which also increase the flow resistance of the vehicles and can lead to a falsification of the measurement results.

Measuring traction torque via telemetric signal transmission

Like all torque wheels of the flexible P1 series, the RoaDyn P1ST/MT/HT wheel torque transducers are quick and easy to install and can be replaced if necessary. The respective torque wheel replaces the center section of the rim, which is the most effective position for recording torques and at the same time offers optimum integration in the vehicle's chassis system. The traction torque *My* is measured using piezoelectric quartz sensors. The electronics integrated in the wheel torque transducer amplify and process the signals. In addition, these torque wheels each have four channels for temperature measuring elements. The data is transmitted wirelessly using the KiRoad Wireless P1 data transmission system, the receiver of which can be positioned inside the vehicle. For further processing, this system can be connected to the KiDAQ from Kistler or any data acquisition system (DAQ system) from other manufacturers. The new RoaDyn P1 series wheel torque transducers are extremely versatile and indispensable for research and development, certification and testing.

Patented technology

Kistler holds a patent for the piezoelectric precision load cell for determining torques on wheels. Among other things, this further development means that this patented load cell delivers even more reliable, high-precision results thanks to the greatest possible protection and technical simplification.

You can find all further information on the RoaDyn P1ST/MT/HT wheel torque transducers here:

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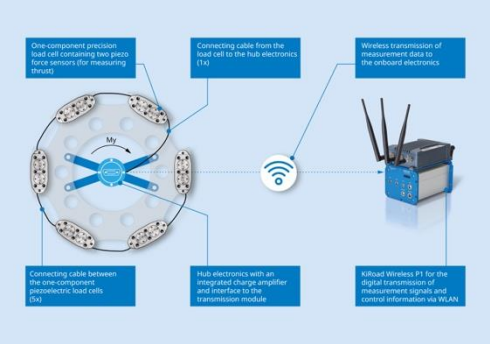
Like the entire P1 torque wheel series for commercial vehicles, the RoaDyn P1HT wheel torque transducer has undergone fundamental further development. It is designed for measurements on heavy trucks. The torque wheel offers two measuring range modes: up to 5,000 N·m in the low-range mode and up to 50,000 N·m in the high-range mode.



Six piezoelectric precision load cells are installed in the RoaDyn P1HT wheel torque transducer shown here. The measurement data is sent to the hub electronics in the center of the torque wheel and transmitted to the KiRoad P1 wireless evaluation electronics via a telemetry module.

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The RoaDyn P1HT wheel torque transducers (for heavy trucks), P1MT (for medium trucks and buses) and P1ST (for light commercial vehicles/vans) are the ideal choice for measurements to determine CO_2 emissions in accordance with EU standards.

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About the Kistler Group

Kistler is the global market leader for dynamic pressure, force, torque, and acceleration measurement technology. Cutting-edge technologies provide the basis for Kistler's modular solutions. Customers in industry and scientific research benefit from Kistler's experience as a development partner, enabling them to optimize their products and processes so as to secure sustainable competitive edge. Unique sensor technology from this Swiss company helps to shape future innovations not only in automotive development and industrial automation but also in many newly emerging sectors. Drawing on our extensive application expertise, and always with an absolute commitment to quality, Kistler plays a key part in the ongoing development of the latest megatrends. The focus is on issues such as electrified drive technology, autonomous driving, emission reduction, and Industry 4.0.

Some 2,000 employees at more than 60 facilities across the globe are dedicated to the development of new solutions and offer application-specific services at the local level. Ever since it was founded in 1959, the Kistler Group has grown hand-in-hand with its customers and posted sales of CHF 424 million in 2025. About 9 percent of this figure is reinvested in research and technology – with the aim of delivering innovative solutions for its customers.