

RoaDyn P106 / P109

Type 9294B...

Wheel torque transducer up to $\pm 9,000$ N·m

The RoaDyn P106/ P109 wheel torque transducers are universal sensors for measuring the traction torque M_y of small and large cars, SUVs, light trucks and high-performance vehicles up to a maximum of $\pm 6,000$ N·m and $\pm 9,000$ N·m respectively.

- Highest accuracy with two independent measuring ranges (10 and 100%)
- Quick and easy mounting on different vehicles with corresponding adaptations
- Setup time less than 15 minutes
- Low additional unsprung mass and low moment of inertia
- 4 additional temperature channels for simple connection of K-type sensors
- Automatic identification and data transmission via farfield telemetry

Description

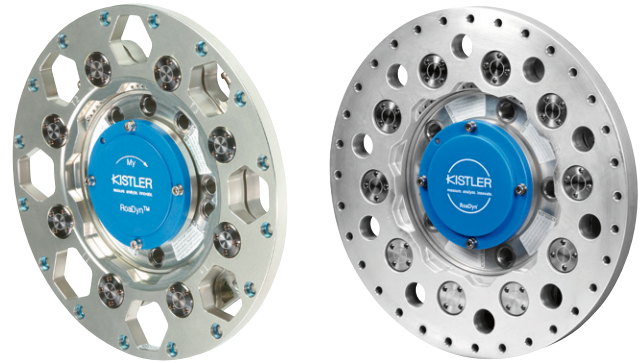
The measuring system has three main components: wheel torque transducer, data transmission module and on-board electronics (control unit). For data transmission from the rotating wheel to the on-board electronics, there is a wireless digital telemetry system available.

The RoaDyn P106/ P109 wheel torque transducers replace the middle part of the rim, thus enabling an optimum integration into the suspension system, i.e. in the most effective position for acquiring wheel forces or torques. Mounting of the wheel torque transducer on the vehicle is comparable with changing a standard wheel.

The traction torque M_y is measured with piezoelectric quartz sensors. The two switchable measuring ranges make it possible to measure small as well as very large torques with a very high accuracy, the prerequisite for efficiency analyses, for example. The signals are amplified and processed in the electronics system integral with the wheel.

For transmission to the customer's data acquisition system, a digital system with CAN bus or DTI bus is available.

The transmission modules are quickly and easily exchangeable. The digital telemetry system (Type 9811B) transmits traction torque M_y and other signals. To monitor temperature, up to four K-Type temperature sensors can be connected to each wheel.



Application

The RoaDyn P106/ P109 wheel torque transducers were designed and developed in close collaboration with the automotive industry for automotive engineering and research applications. The main focus is on

- Rolling resistance measurements for reduction of CO₂ emission
- Research and development of ABS systems
- Research and development of dynamic control systems
- Research of efficiency analyses of hybrid and electric drivetrains
- Vehicle performance measurements
- Determination of powertrain efficiency
- Recording load data for transmission development (simulation, validation)
- Analysis of fading effects on brakes

Other applications include the development of transmissions and chassis control systems, and preparation of government safety tests such as the American Standard FMVSS 135.

Technical data

			P106	P109
Measuring range				
Torque, upper range	M_y	N·m	$\pm 6,000$	$\pm 9,000$
Torque, lower range	M_y	N·m	± 600	± 900
Calibration range forces	F_x, F_z	kN	0 ... 20	0 ... 30
	F_y	kN	0 ... 12	0 ... 18
Max. vehicle mass ¹⁾	m	kg	2,500	3,500
Max. loads for forces ²⁾	F_x, F_z	kN	± 24	± 60
	F_y	kN	± 15	± 36
Max. loads for torques ²⁾	M_x, M_z	N·m	$\pm 6,000$	$\pm 7,500$
	M_y	N·m	$\pm 7,200$	$\pm 9,000$
Operating temperature range	T	°C	-25 ... 80	
Max. speed	n	min ⁻¹	2,200	
Shock resistance		g	50	
Degree of protection	IP		65	
Thermal zero offset	$e_{Tk0, My}$	N·m/K	≤ 2	

Accuracy

Crosstalk, F_y to M_y	$e_{cross, My (Fy)}$	N·m/kN	$\leq \pm 2$
Crosstalk, F_z to M_y	$e_{cross, My (Fz)}$	N·m/kN	$\leq \pm 2$
Linearity	$e_{Lin, My}$	%range	$\leq \pm 1$
Hysteresis	$e_{Hist, My}$	%range	≤ 1

Other Technical Data

Rim sizes (other sizes on request)		Inches	13 ... 20	
Temperature measuring element	Type		K(NiCr-Ni)	
	Number		4	
Weight	m	kg	5.0	6.6
Moments of inertia (calculated)	J_x	kgm ²	26×10^{-3}	36×10^{-3}
	J_y	kgm ²	48×10^{-3}	69×10^{-3}
Conforms to the following directives			89/336/EWG	
EMC emitted interference			EN61000-6-4:2001 (EN55011 class A)	
EMC disturbance immunity			EN6100-6-2:2001	

¹⁾ Durability: SAE J328 / guidelines no. 287, §30 StVZO, Germany

²⁾ It is assumed that the maximum forces and torques do not act simultaneously.
The torques are specified relative to the center of the wheel (Offset = 0)

Dimensions

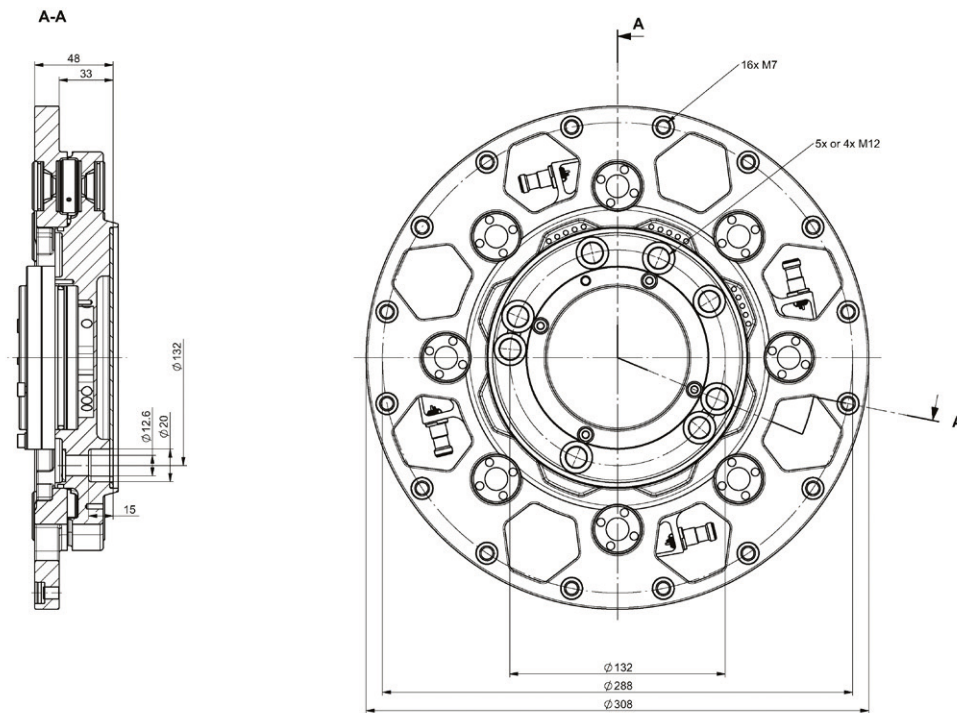


Fig. 1: RoaDyn P106 Dimensions

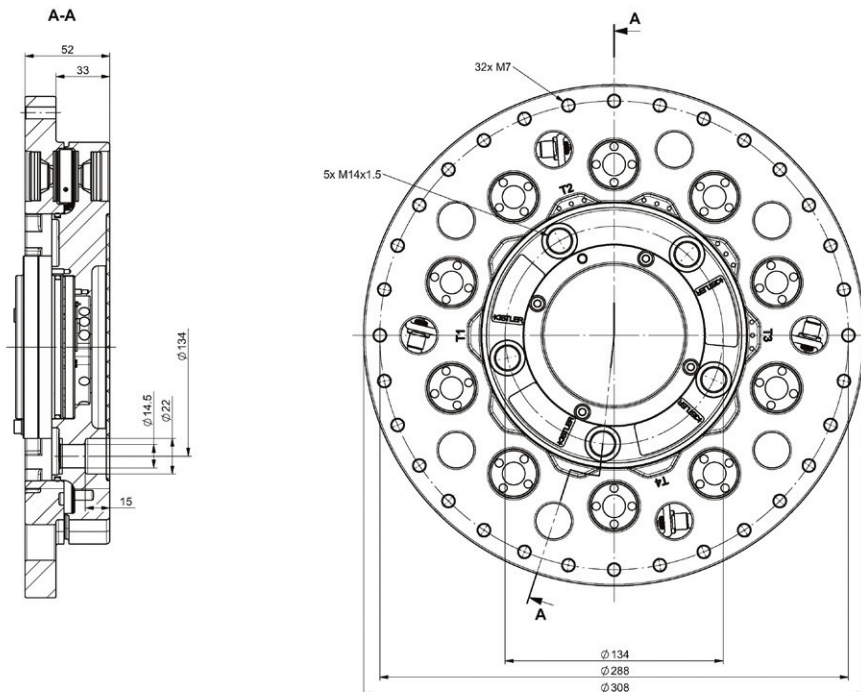







Fig. 2: RoaDyn P109 Dimensions

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Measuring chain

	RoaDyn wheel torque transducer	Telemetry Type 9811B		On-board unit Type 9813D	Available measurement signals
RoaDyn P106 Type 9294B11					Torque M_y 1 x temperature in hub electronics 1 x battery voltage (rechargeable battery) 4 x temperature
RoaDyn P109 Type 9294B13					

Included accessories

P106:

- Fixing screws M12
- Fixing screws M7

Type/art. no.

 65012798
 65007919

Ordering Code

- RoaDyn P106
- RoaDyn P109

 Type 9294B11
 Type 9294B13

P109:

- Fixing screws M14x1.5
- Fixing screws M7

 55153589
 55231122

Optional accessories

- Wireless telemetry transmission module for RoaDyn P1xy, power supply by rechargeable battery
- On-board electronics for RoaDyn P1xy, for use with wireless telemetry transmission module Type 9811A, serves up to 4 RoaDyn P1xy (digital/analog output)

Type/art. no.

9811B

9813D

Other optional accessories

- Rim ring with rim adapter (customized)
- Hub adapter 4-, 5-, 6-hole (customized)
- Wheel balancing adapter
- Spacer for wheel balancing adapter for adjustment to wheel offset

Type/art. no.

9877A...

9869A...

Z18432

Z17984Q...

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