KISTLER
measure. analyze. innovate.

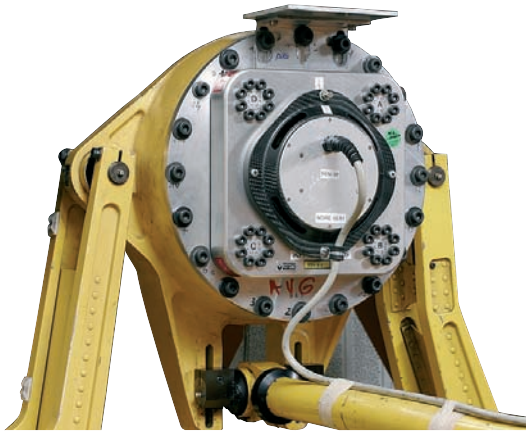
RoaDyn® S625 nsp System 2000

Type 9266A2

for Test Stand Measurement of Light Cars

Wheel force sensor for measuring three forces and three moments on non-spinning wheel for operation on vehicle test stands.

- Modular arrangement with interchangeable load cells and system components
- Used in conjunction with CAD/FEM aided design to minimize stress concentrations
- Standard version manufactured from aluminum alloy can be used during fatigue test monitoring
- Precise signal acquisition with individual calibrated strain gage load cells
- Independent identification of sensor components
- Capable of recognizing individual load cell calibration values



Description

The modular RoaDyn S625 nsp sensor is highly adaptable to suit different hub and test stand geometries. Four individual load cells are connected to the force application system of the test stand and to the vehicle hub with adapter components. In these cells the signals are amplified and passed on to the hub electronics Type 5243A… via short cables. There they are filtered, digitized and encoded. The stream of data is passed on to the control room electronics Type 9887A… via a cable Type 1700A88xx... and output to the test stand electronics or a data acquisition system. The control room electronics unit is described in datasheet 9887A_000-579.

Individual Type 9190A load cells are factory calibrated and output temperature-compensated, amplified measurement signals in the three spatial directions. Identification and calibration data of the individual forces is saved and allows systematic conversion into the vehicle coordinate system on the basis of the calibrated individual values. High measuring accuracy is retained during transmission, as digitization takes place on the wheel to avoid transmission interference. The fact that the measured individual signals are known allows rapid troubleshooting in the event of malfunctions. Individual cells can be replaced without impairing sensor operation.

12-channel Type 5243A12 and 18-channel Type 5243A18 versions of the hub electronics are available. The incoming signals are filtered and, after being digitized, sampled at 5 kHz and a resolution of 16 bits. The signal delay arising between the measuring time and signal output is less than 1 ms.

Application

The sensors are predominantly used as a multiaxial force measuring unit in road simulators. The test stand control data is determined with measuring wheels employing the same principle.

The sensors are mainly used in pairs, for example for testing a complete vehicle (4 wheels) or just one axle (2 wheels). Measurements with a single sensor are also used for component development. As subsequent test vehicles often necessitate adaptation to suit wheel and hub geometries, the modularity of the measuring wheels and expert support by Kistler Application Centers have proven invaluable.

9266A_000-580e-05.06

KISTLER
measure. analyze. innovate.

Technical Data

Measuring range	F_x	kN	±20
	F_y	kN	±15
	F_z	kN	±20
	M_x	kN·m	±4
	M_y	kN·m	±4
	M_z	kN·m	±4

It is assumed that the extreme values do not act simultaneously.
The moments are specified relative to the center of the wheel.

Maximum Loads

Permissible reversed stress (rotating bending test);
SAE J328 requirements are exceeded.
500 000 cycles of reversed flexure to 2,6 kN·m

Max shock acceleration	x	*g*	40
	y	*g*	20
	z	*g*	40

Accuracy

Crosstalk	$F_y \rightarrow F_x, F_z$	%	≤1
	$F_x \leftrightarrow F_z$	%	≤1
	$F_x, F_z \rightarrow F_y$	%	≤2
Linearity		% v.E	≤0,5
Hysteresis		% v.E	≤0,5

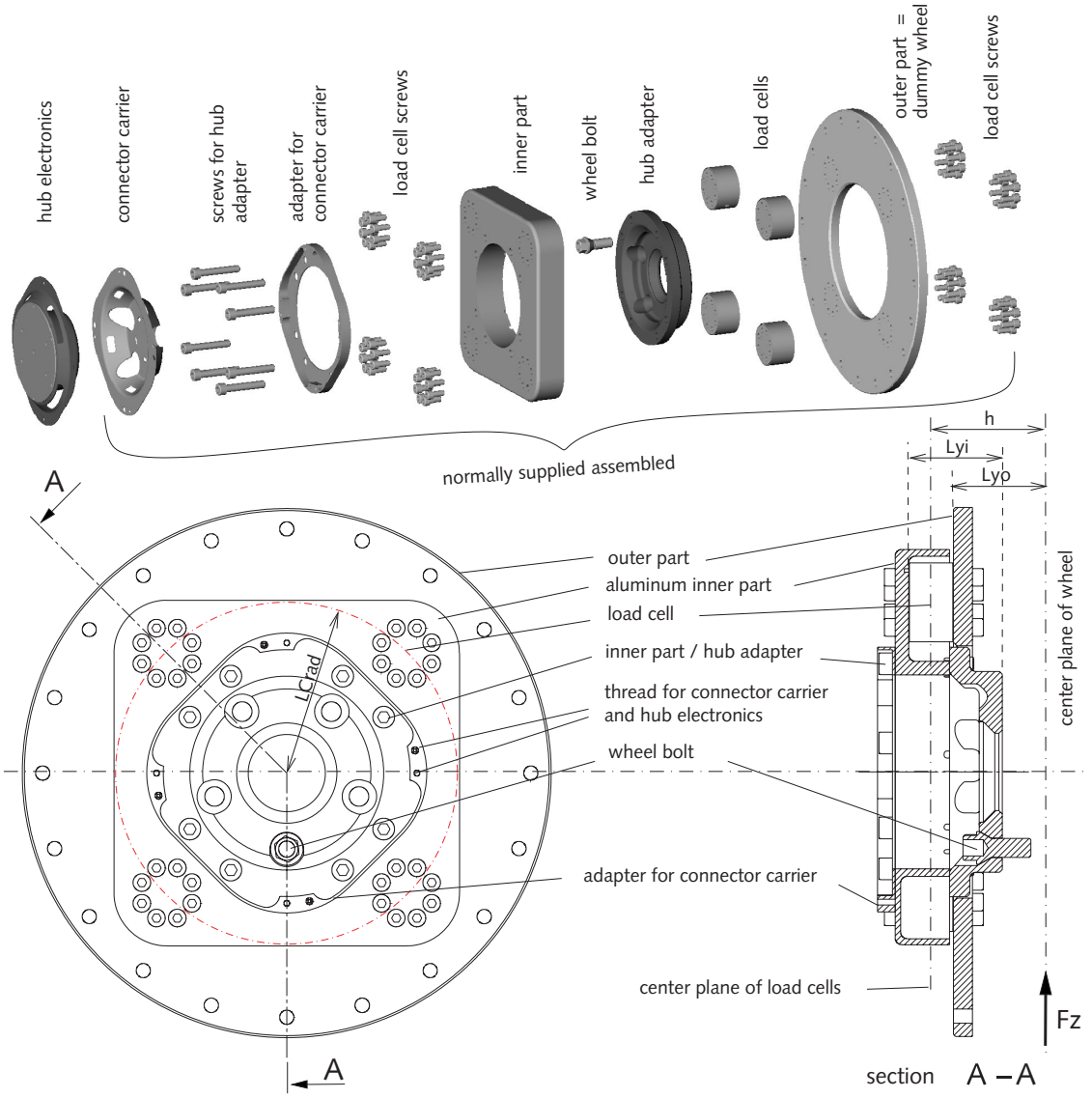


Fig. 1: Design and components of RoaDyn S625 nsp

9266A_000-580e-05.06

©2006, Kistler Instrumente AG, PO Box, Eulachstr. 22, CH-8408 Winterthur
Tel +41 52 224 11 11, Fax +41 52 224 14 14, info@kistler.com, www.kistler.com

KISTLER
measure. analyze. innovate.

Mounting
Special adapters have to be individually designed for mounting the sensors in a test stand. Kistler requires the corresponding dimensions of the test stand force application system and the hub of the tested vehicle in order to prepare a quotation.

Adaptation to Suit Hub
Today's vehicles encompass a considerable variety of hub geometries. They are described by the following parameters:

- Number of stay bolts or tapped holes
- Dimensions of the wheel bolts or stay bolts and nuts (thread diameter, pitch, length and threaded length)
- Wheel bolt connection pitch diameter
- Axle centering as a fitting dimension
- Wheel offset
- Brake contours
- Parts protruding from hub
- Miscellaneous

It is necessary to obtain precise details in order to prepare for fabrication of the adapter. The relevant Kistler Instruction manual (002-280) contains a checklist, which can be completely filled in to considerably speed up the process of clarification.

Accessories included	**Type/Art.-No.**
• Precision (strain gage based) load cells fully encapsulated 1 set (4 pcs.) per wheel sensor	9190A44.6
• Inner part The pattern of holes must be defined 1 pc. per wheel sensor	9703A1
• Connector carrier for wheel electronics 1 pc. per wheel sensor	Z39904
• Load cell mounting screws 1 set per wheel sensor	Z30073

Optional Accessories	**Type/Art.-No.**
• Outer part 1 pc. per wheel sensor incl. 1 set of load cell screws	9707Ax
• Hub electronics 1 pc. per wheel sensor	5243A...
• Special wheel-/hub electronics for combined use on test stand and vehicle	5443A...
• Hub adapter incl. Ti screws (adaptation for axle centering and wheel offset) 1 pc. per wheel sensor	9705A V100.0007
• Wheel bolts 1 set per wheel sensor	Z30076/77/78
• Carrying case for up to 2 sensors	V712.0004
• Load cell tester 1 pc. per measuring system	5984A

Ordering Code	**Type**
• RoaDyn S625 nsp Whell force sensor for test stand measurement of light cars	**9266A2**

Fig. 2: RoaDyn S625 System 2000 non-spinning on vehicle test stand

9266A_000-580e-05.06