



VISHAY INTERTECHNOLOGY, INC.

LOAD CELLS

# FORCE AND LOAD SENSING FOR INDUSTRIAL VEHICLES

Vishay Transducers



MARKET SOLUTIONS



# Weight, Force, Load, and Stability Sensors

Designed for Long Life, High Performance, and Low Cost of Ownership

## The Experience You Need

Vishay Transducers is the world's leading manufacturer of weight, force, load, and stability sensors for the industrial vehicle market with many years' experience of research and development in the latest technologies and modern manufacturing methods. With manufacturing and support facilities in Europe, North America, the Middle East, and the Far East, we are ideally situated to support our global customers in the industrial vehicle market.

## Experts in Your Field

Vishay Transducers sensors have been developed for many different applications, some of which are detailed below. For further information or to discuss your own specific needs, please contact your nearest Vishay Transducers office.

## Telescopic Handlers

Given the complex boom extension, boom angle and lifting load combinations, a reliable and foolproof overload monitoring system is essential. The fitting of load sensors to the rear axle assembly to measure the reaction between the wheels and the ground, ensures that dangerous overload conditions are detected well in advance.

## Mobile Cranes

Load distribution can be measured by incorporating force sensors in the telescopic stabilizers, while bending and twisting forces within the complex boom can be measured to provide important stability information. If there is any possibility of the crane becoming unstable, the system can prevent the crane operation from proceeding and only allows the operator to pull back to a secure situation.

## Vehicle Stability

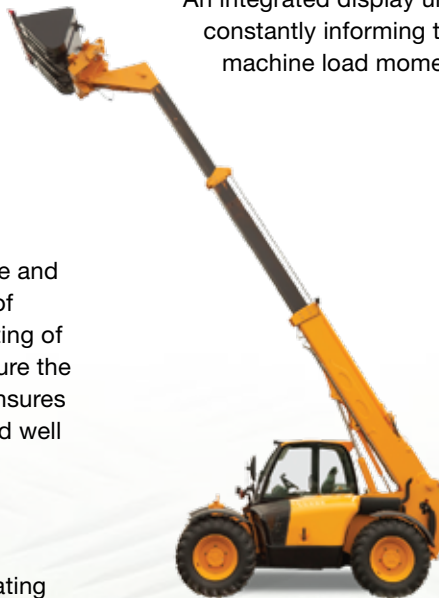
By fitting load sensors to the rear axle assembly to measure the reaction between wheel and ground and comparing the load distribution across the axle, the control system can prevent the vehicle from tipping sideways if used on uneven or unstable ground.

## Electronic Draft Control

By fitting one or more shear pins into a tractor linkage, the force between the tractor and the implement being pulled can be measured. Using this data, the optimum mix of draft and position for a particular task, together with the drop rate relevant to the implement's weight, can be automatically controlled.

## Extensometers

Vishay Transducers extensometers are used as safety overload sensors on the rear shaft of telescopic handlers. An integrated display unit is located in the cabin, constantly informing the operator on the momentary machine load moment.



## Highest Reliability and Long Term Stability

Force sensors can be designed to measure tension and compression forces, bending and shear moments, torsion, torque pressure, and weight.

Most force sensors are based on strain gage technology. In contrast to the explosive development of modern electronics, this technology has stood the test of time since it was first used for aircraft weight and balance measurement in the 1930s.

Although the technology has been refined considerably over the years, the fundamental principle remains. The reliability and performance of any such sensor is directly dependant upon the integrity and repeatability of the strain gage bonding procedure and the uniformity of the sensor material.

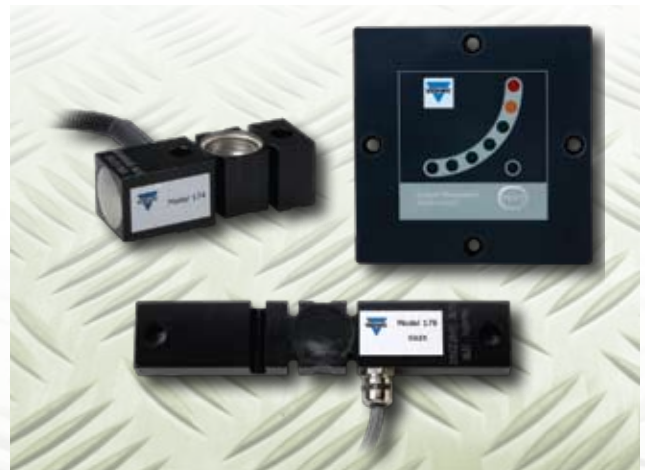
Precise clamping pressures and temperature curing are essential and Vishay Transducers has pioneered a number of innovative techniques in the volume production of sensors, which ensures cost effective products of the highest reliability and long term stability.

## At the Forefront of Design

Vishay Transducers have been at the forefront of load cell design for over 30 years. With a reputation which is second to none, our products are employed in every conceivable type of weighing and force measuring application throughout the world, from fish scales in Iceland to coal bunkers in Australia and tractors in Romania to hospital beds in the USA.

## Options

Application specific options include sealing to IP68 for total liquid immersion, Intrinsic Safety approvals to EEx ia IIC T6, OIML certification, current matched outputs and an extensive range of mounting hardware to simplify installation and enhanced performance.



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**VISHAY MEASUREMENTS GROUP:**

Vishay Micro-Measurements  
Vishay Transducers  
Vishay Systems – Weighing and Force Measurements



One of the World's Largest Manufacturers of  
**Discrete Semiconductors and Passive Components**

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