

## **LVDT Position Sensors Ensure Accurate Floor Landing of Elevator Cars**



Macro Sensors ([www.macrosensors.com](http://www.macrosensors.com))

[1]) Spring Loaded LVDT position sensors (also known as gaging probes) are serving as integral components in control systems that ensure the accurate landing of elevator cars at building floors. As passengers travel on elevators at speeds upwards of 2,000 feet/minute, electromechanical control systems rely on sensors to provide the necessary feedback for proper alignment of elevator cars at building floors upon arrival.

To ensure a smooth and comfortable ride, elevator cars are suspended by springs within an outer frame that provide cushioning against the effects of acceleration/deceleration and the initial starting and stopping 'jerks' caused by inertia. As an elevator is loaded with passengers, these springs compress changing car position within the frame that can affect final car position at the destination floor. To ensure that both cars and building floors properly align upon arrival, Macro Sensors Spring Loaded LVDT position sensors are used to measure the difference between the frame and car position. Specifically, the sensors are measuring 'spring deflection' as a result of the passenger load.

Depending upon the elevator manufacturer, sensors are mounted either under or above the elevator car. When measurement is made from above, the probe of the spring-loaded LVDT position is normally compressed, and extends as the load increases. When sensors are installed below the elevator platform, the probe is normally extended, and compresses as load increases. Output is fed into a control system that uses the displacement information to adjust the travel of the frame, so that when the elevator car doors open, the car floor is level with the building floor on which passengers are exiting.

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Macro Sensors Spring Loaded LVDT Position Sensors are the sensor of choice for providing this crucial measurement because of their field-proven design and high reliability. With available stroke ranges of +/-0.050" to +/-2.0" (+/-1.25 mm to +/-50 mm) in both AC and DC input/output configurations, these hermetically sealed sensors (IEC IP-68) are designed and manufactured rugged and robust, enabling them to survive heavy shocks as well as the effects of dirt, water, steam and other corrosive elements without effecting performance.

Internal construction consists of a spring-loaded shaft running in a precision sleeve bearing connected to the core of an LVDT. The probe shaft of the position sensors is fully extended by a spring exerting a nominal force of 6 to 20 ounces depending upon total range. The contact tip supplied is an AGD standard number 9 made from black oxide hardened tool steel. It is fully interchangeable with other 4-48-threaded AGD contact tips.

While Macro Sensors offers its Spring Loaded LVDT Position Sensors in both AC-or DC-operated versions, DC-operated units incorporate integrated electronics that provide a 4-20mA, single ended or bipolar DC output compatible with most standard PLCs, digital indicators, and data acquisition systems.

Macro Sensors also offers metric calibration options for all Spring-Loaded LVDT Position Sensors.

For additional information regarding Macro Sensors Spring Loaded LVDT Position Sensors, refer to the web site at

[http://www.macrosensors.com/spring\\_loaded\\_lvdt.html](http://www.macrosensors.com/spring_loaded_lvdt.html) [2] or contact Macro Sensors at [positionsensors@macrosensors.com](mailto:positionsensors@macrosensors.com) [3]

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### Links:

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