

Crane Safety Systems

(Boom Angle Measurement, Safe Load Indicators, Load Moment indicators)



Cranes of various types and sizes are employed daily, to accomplish numerous lifting jobs worldwide. Unfortunately, innumerable accidents have occurred, many of which were fatal, which involved the crane falling or tipping over under load. Subsequent investigations into the root cause of these

accidents have yielded various conclusions.

Regardless of the actual cause, it is generally acknowledged that if the operator had received some type of warning of the impending accident, the majority of them could and would have been avoided.

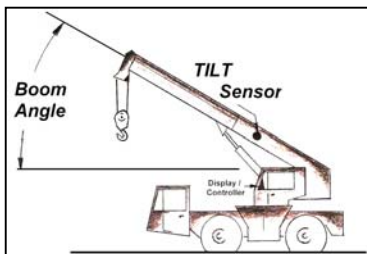


To eliminate these type accidents from occurring, manufacturers developed safety systems. Known in the industry as 'safe load indicators' or 'load moment indicators', these sophisticated systems are capable of monitoring numerous crane variables. One of the most essential and critical measurements required to make these systems effective is boom angle, which typically has a range

of 0-90 (+/-45)

degrees maximum.

This is accomplished using an inclinometer (or tilt sensor), and is a classic application for these devices.



The majority of other manufacturers inclinometers commonly used to measure boom angle, fall into one of the following categories. Some perform well in terms of linearity, but have relatively large temperature coefficient errors (silicon based). Others perform well in both linearity and temperature, but have poor repeatability and/or hysteresis (potentiometer / pendulum technology), or vice versa. The typical stated accuracy's of these type sensors range from +/-1.5 to over +/-3 degrees.

With boom angle changes in the fractions of a degree equating to dramatic changes in the actual working load on the crane, the need to reduce or eliminate these errors is apparent. *Spectron* recognized this need in the industry for a rugged, cost effective, high performance tilt sensor, and developed the SPECTROTILT™ RS232 *Electronic Inclinometer*. By employing on-board linearity correction and temperature compensation, intrinsic errors have been eliminated, thereby improving accuracy to < +/-0.3 degrees over a +/-60 degree angular sensing range. The SPECTROTILT™ also features a proprietary, glass/ceramic hybrid sensing element, full ESD and EMI protection, an aluminum housing, and a fully potted electronics to provide superior environmental protection.