A Stellar Technology White Paper

Stellar Technology's Series MIN830 Load Cells –

Force Measurement Solutions in a Small Package

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Stellar Technology's Miniature MIN830 Compression Load Cell

Stellar Technology's new line of Series MIN830 load cells provides a rugged force sensor for compression loading applications where small size is essential. These low profile and small diameter load cells incorporate strain gage sensing technology within a very compact, stainless steel sensor body. This combination of material, foil strain gage technology , and a proprietary sensor configuration results in 1 inch to 2 inch diameter sensors capable of measuring loads from 10 lbf to 30,000 lbf. Custom sizes and capacities can reach up to 100,000 lbf.

During the force measurement application, a compression load is applied to the load button of the MIN830 resulting in an elastic deformation within the load cell body. A full Wheatstone bridge array of bonded foil strain gages, designed to sense the maximum strain caused by the deformation, converts the microstrain within the stainless steel body to a change in strain gage resistance. This change in resistance results in a proportional change in the electrical output signal generated.

Small size and very low mass are two very significant factors affecting the performance of bonded foil strain gage transducers. Since the MIN830 incorporates both, it allows operation over a very wide frequency range; from static up to 20 kilohertz. Since the bridge network is bonded to the deflecting body of the force sensor, there are no loose parts or mechanical connections to produce error.

The bonded foil technology is very stable over the operating temperature range and has very predictable thermal effects which simplify thermal compensation and correction methods. This also results in improved accuracy. The operating temperature range of the MIN830 is - 65ºF to + 250ºF. Custom temperature ranges can be down to -300ºF and up to 450ºF.

The standard MIN830 configuration produces a 2 mV/V output signal with a nominal bridge resistance of 350 ohms. With a slight increase in the height of the 2 inch diameter force sensors, internal signal conditioning electronics can be incorporated into the unit. The internal signal conditioning provides current (4-20mA) and voltage (+/-5V or +/-10V) analog outputs or digital outputs (RS232, RS485, CANbus).

For many force measurement applications, the amount of real estate available for locating the sensor is limited. In other applications, the mass sensor's mass affects the application solution. Stellar Technology engineering has addressed both issues by combining a low profile with a small diameter. These features, coupled with the all welded stainless steel construction make the MIN830 ideal for industrial robotics applications, automation and control systems, force-over-area

measurements for pressure, process control measurements, structural model simulations, payload weight distribution systems, and a myriad of test, measurement, and control applications.

Stellar Technology design engineers work directly with those customers requiring special configurations based on the basic MIN830 design. STI offers a comprehensive offering of load cells in addition to the MIN830. Our engineers invite you to visit the Stellar Technology website (www.stellartech.com) and review our complete line of load cells, force sensors, pressure transducers and transmitters, temperature transducers, displacement sensors, and instrumentation for test and measurement solutions in all market sectors. For detailed specifications or to request a quote on the MIN830 or any other STI product, please call 717-250-1900 or email sales@stellartech.com. Stellar Technology, Inc. is an ISO9001-2000 registered company with engineering and manufacturing located at 237 Commerce Drive, Amherst, NY 14228, USA.