bf1systems Intelligent Amplifier

The bf1systems intelligent amplifier corrects the errors normally associated with standard strain gauge installations. Strain gauged components have inherent accuracy problems; temperature effects on a strain gauge are not linear, gauges are affected by temperature gradients across the gauged part and each strain gauge has a different calibration.

When a strain gauged component is temperature compensated by standard methods the offset compensation is only performed at 2 temperatures and the effects minimised at these points. What happens at other temperatures can lead to unexpected errors in the load cell. As the temperature effects are non-linear the errors can be quite significant.

The bf1systems intelligent amplifier measures the temperature of the strain gauges, applies a correction at each temperature step for offset and span errors in the calibration. Thereby producing an output that is far more accurate than even the best compensated gauges.

As the system is microprocessor controlled, we can calibrate the system gain to provide a standard output for every part in a set. There is no need to enter a specific part calibration and therefore there is no chance of mistakes when entering the calibration. Each part is individually calibrated in a computer-controlled oven over a full load and temperature range and each part retains its own unique calibration table.

The miniaturised design of the system allows the sensor electronics to be mounted directly on the rod end, track rod, steering column or any other load bearing part. Due to the sensor electronics being very close to the strain gauging, signal noise is reduced to a minimum. The output is a low impedance 0-5V signal that does not require screening or separate amplification.

Typically, this system would produce a rod-end load cell with a 0.5-4.5V output measuring 0-4000kgf, with every part having the same calibration of 1000kgf/V. This calibration factor is user definable as is the zero offset.

To benefit fully from the system, the gauged part has to be a suitable shape for strain gauging. Many parts that are strain gauged are not suitable for the job and introduce errors that cannot be removed by any means.

Due to the unique nature of each customer's installation, our in-house design team may recommend modifications to existing parts. We can also design or consult on the shape of strain gauge parts for maximum accuracy.

We offer a full design, consultation and manufacturing service for the bespoke parts of the system and aim to deliver a customised system as a complete package.

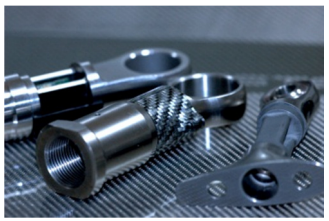
Specification

Electrical

- 7 - 18 Volt supply range
- Non-ratiometric output, supply voltage changes do not affect the output.
- Supply current <30mA
- High level 0 - 5V output, no requirement for additional strain gauge amplifiers
- Identical output for all parts, no calibration data entry for each part
- Thermal zero shift over compensated range 0.1% FSO
- Thermal sensitivity shift over compensated range 0.2% FSO
- Internal 150Hz 2–pole low-pass Butterworth filter

Environmental

- Compensated temperature range 10°C to 125°C
- Operating temperature range 0°C to 125°C
- Sealed to IP65



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