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MODEL 3570

DC STRAIN GAGE PANEL METER
[3500 SERIES]



DC STRAIN GAGE PANEL INSTRUMENT WITH ANALOG SIGNAL CONDITIONED OUTPUT, LIMIT CONTROL AND COMPUTER INTERFACE CAPABILITIES.

The **Model 3570** DC Strain Gage Conditioner is a general-purpose instrument for input of pressure, force, torque, weight, and other variables measured by DC excited strain gage transducers. It accepts a single input from any conventional 4-arm strain gage bridge, nominal 120 Ohm or higher, with a full-scale range of **0.75, 1.5 or 3.0 mV/V**. Optional bridge-completion circuitry—allows input from a 2-wire 1/4-bridge, 3-wire 1/4-bridge, or 1/2-bridge gage configuration.

Advanced circuit design overcomes many of the errors traditionally afflicting the strain gage measurement process, resulting in rock-solid digital indication and noise-free analog output. Other important **3570** features include

- **selectable bridge excitation** (nominal 2, 5, or 10 V-DC)
- **remote sensing and regulation of bridge excitation**—eliminates errors from temperature effects on cable resistance and yields consistently stable ratiometric measurement, unaffected by possible power-supply drift
- **input impedance in excess of 100 megohms** preserves the validity of factory calibration, prevents conversion of commonmode to normal-mode signals, and eliminates remaining errors attributable to cable resistance. Allowable cable length has virtually no practical limits.
- **selectable active low-pass filtering** smooths unwanted dynamic signal components arising from vibration, power impulses, etc., that might prevent stable digital conversion or control action (see Specifications)

Simple two-point “zero and span” calibration is provided for the **3570's** input channel. In addition, a 100-kOhm, 0.1% shunt resistor is supplied. You can use this resistor— or one of your own—to apply an “equivalent input” for calibration purposes, when the transducer’s fullscale mV/V sensitivity is accurately known. The calibration shunt may be switched in and out for either a positive or negative up-scale reading via simple commands issued to the RS232/RS485 port or by means of logic-level command signals through the rear Analog Input Connector. A third calibration technique for the **3570** involves application of a special command (MVV) through the 35K MODEL CONDITIONER RS232/RS485 Interface Port when both “mV/V” sensitivity and corresponding full-scale rating of the transducer are known. The **3570** offers all standard 3500 Series features, including selectable digital smoothing, custom 15-segment linearization; HI/LO limit monitoring with logic I/O; scalable analog output; analog +peak capture; automatic tare offset; digital track and hold; and either singlenode (RS232) or multinode network (RS485) communications. The instrument can be completely set up and operated either through the front-panel keypad or via simple mnemonic commands received from an external computer or terminal through the RS232/RS485 Interface Port.

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SPECIFICATIONS:

Input Type: Conventional 4-arm strain gage bridge, nominal 120 Ohms or higher NOTE: 1/4- and 1/2-bridge gage configurations can be accomplished by means of the Model 10CJB-2 Bridge Completion Card, or by equivalent external bridge completion circuitry supplied by the user.

Input Ranges (full-scale)*:

	1	2	3	4
1	Actual Absolute Input at which			
2	Nominal Normal-Mode Maximum Display Reading			
3	Input Input-Signal Overrange Corresponds			
4	Range Voltage (Max) (50%) to "m" Term			
	1	2	3	4
	3.0 mV/V	45 mV	4.5 mV/V	4.0 mV/V
	1.5 mV/V	22.5 mV	2.25 mV/V	2.0 mV/V
	0.75 mV/V	11.25 mV	1.125 mV/V	1.0 mV/V

Operating Temperature: 0° C to +50° C (+32° F to +122° F)

Storage Temperature: -40° C to +80° C (-40° F to +176° F)

Operating Humidity Range: 10 to 95% max., noncondensing

Instrument Weight: 3.25 lb (1.47 kg), approximate

Dimensions: 5.68" W x 2.84" H x 7.06" D

Power

Voltage: 90-265 V-AC (eliminates the need to convert between 110-V and 220-V levels) Frequency: 50-400 Hz Consumption: 10 W max.

Display: 5-digit LCD reflective, non-light-emitting

A/D Conversion: 16-bit; approximately 1-kHz conversion rate; transparent autocalibration every 2 seconds

Excitation Supplied: Selectable 10, 5, or 2 V-DC; 85 mA max.

Normal-Mode Range: ±45 mV operating; ±8 V without instrument damage

Common-Mode Range: ±0.50 V operating; ±8 V without instrument damage

Common-Mode Rejection Ratio: -60 dB at DC; -90 dB at 60 Hz, 1 kHz, and 3 kHz

Input Impedance (Differential and Common-Mode): Greater than 100 M Ohm

Offset: Initial: ±0.025% of full scale; vs. Temperature: ±25 ppm/°C; vs. Time: ±10 ppm/month

Gain Accuracy: ±0.02% of full scale ± 1 count LSD, typical, following calibration**

Gain Stability: Vs. Temperature: ±50 ppm/°C; vs. Time: ±20 ppm/month

Analog Output

Full-Scale Range: ±5 V nominal; ±8 V maximum Range is scalable in 0.1% increments between 74.5% and 125.5% of nominal input.

Allowable Loading: 5 mA, maximum

Offset Range Adjustment: ±25.5% in 0.1% increments

Offset Accuracy: 0.1% maximum

Span Accuracy: 0.2% maximum

Offset and Span Drift: ±50 ppm/°C; ±20 ppm/month

Configuration: Single-ended, return to System Common

Analog Filtering:

Fixed: 2 kHz; **Selectable:** 5-pole filter with selectable low-pass corner frequency of 5, 10, or 20 Hz

Corner Frequency

Response at . . .	5 Hz	10 Hz	20 Hz
-3 dB	5 Hz	10 Hz	20 Hz
-60 dB	32 Hz	65 Hz	125 Hz

Step Response Settling Time (Full-Scale Output)

	5 Hz	10 Hz	20 Hz
To 1% of final value	250 ms	125 ms	60 ms
To 0.1% of final value	400 ms	200 ms	100 ms
To 0.02% of final value	600 ms	300 ms	170 ms

Peak Capture: Positive analog peak, digitally held for indefinite display; minimum full-scale input pulse duration is 6 msec (to 1% of full-scale accuracy), 12 msec (to 0.1% of fullscale accuracy), and 20 msec (to 0.02% of full-scale accuracy); PEAK and TRACK modes controlled by front-panel button, rear-panel logic input (see Fig. 35.6), or computerport command