MODEL 563H
TRANSDUCER CONDITIONER-AMPLIFIER

SENSOR COMPATIBILITY

- Strain Gages
- Pressure Transducers
- Load Cells
- Thermocouples
- Accelerometers
- Piezoresistive Sensors

APPLICATIONS

- Wind-tunnel Instrumentation
- Railroad-track Analysis
- Flight Testing
- Vehicle Testing
- Dynamic-vibration Analysis

PERFORMANCE HIGHLIGHTS

- Bandwidth dc to 200 kHz
- Optional 5-step Selectable Filter
- Variable Excitation—0.1 V dc to 15 V dc
- Null Indicator LEDs
- ¼-, ½-, and Full-bridge Completion
- Bridge Balance and Shunt Cal
- Gains from 0.01 to >2500

The Ectron Model 563H Transducer Conditioner-amplifier is ideal for use with almost all transducers, especially strain gages, thermocouples, and other bridge sources. This versatile product was designed to accurately process low-level signals in electrically noisy environments by providing excellent common-mode, normal-mode, and EMI noise rejection.

Model 563HL

Model E513-2A
Two-channel Enclosure

Model E513-6A
Six-channel Enclosure

Model R513-16
Sixteen-channel Enclosure

Track Inspection Car

An example use of the Model 563H is in railroad track inspection where a specially equipped car is driven over tracks even at high speed. Strain gages on the wheels produce force signals that are coupled through slip rings, then amplified by 563Hs. Special algorithms developed by our customer identify track anomalies that can then be repaired before a derailment occurs.

Data derived from the Model 563H signals determine numerous conditions such as crushed rail heads, mismatched joints, and poor track supports. Excellent data is produced by the Ectron conditioner-amplifiers despite the presence of RF, shock, vibration, and acoustic noise.

SPECIFICATIONS

The following specifications are the maximum deviation from the ideal permitted in this Ectron instrument. RTI means referred to input; RTO, referred to output.

INPUT CHARACTERISTICS

Configuration: Differential, direct coupled. May be used inverting, noninverting, or single-ended.

Input Impedance: 50 MΩ in parallel with 300 pF max. 1 MΩ in divided-input mode.

Common-mode Voltage: ±10 V dc or peak ac, operating. ±300 V dc or peak ac in divided-input mode.

Common-mode Rejection, dc to 60 Hz with 350 Ω unbalance: 50 dB + gain in dB.

Maximum Input Overload: ±20 V dc or peak ac. ±300 V in divided-input mode.

Source Current: ±2 nA/200 hours ±0.5 nA/°C.

Zero Stability, 200 hours: ±4 µV RTI ±0.35 mV RTO.

Zero Temperature Coefficient: ±1 µV/°C RTI ±0.35 mV/°C RTO.

RTI Zero Range: More than ±350 µV with a 20-turn potentiometer.

DYNAMIC RESPONSE

Slew Rate: Gain of 1, >1.2 V/µs; Gain of 2, >2.4 V/µs; Gains of 5 to 1000, >6.3 V/µs.

Settling Time: 15 µs to 0.1% of final value.

Overload Recovery: 50 µs to within ±0.1% of final value from 500% overload.

Bandwidth (within 3 dB):

Small Signal, 1 V rms: dc to >200 kHz.

Full Signal, 20 V p-p:
Gain <×1: dc to >100 kHz.
Gain ×1: dc to >20 kHz.
Gain ×2: dc to >50 kHz.
Gain ×5 to ×1000: dc to >100 kHz.

Noise, 0.1 Hz to 200 kHz: 4 µV RTI + 0.5 mV RTO rms.

0.1 Hz to 10 Hz: 0.75 µV RTI + 0.1 mV RTO peak.

OUTPUT CHARACTERISTICS

Output Voltage: ±10 V dc or peak ac.

Output Current: 10 mA, 100 mA available optionally. Short-circuit protected.

Output (RTO) Zero: ±10 V, ±1 V, ±0.1 V switch selectable, 20-turn potentiometer.

Gain Steps: 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000, plus a board-mounted 100:1 input divider switch.

Gain Accuracy: ±0.1%.

Gain Stability, 90 days: ±0.01%; ±0.005%/°C.

Gain Vernier: ×1 to ×2.5 with 20-turn potentiometer and in-out switch. (Gain continuous from 0.01 to >2500.)

Linearity: ±0.005% of best straight line through zero.

EXCITATION SUPPLY

Voltage Range: 0.1 V dc to 15 V dc adjustable using a 20-turn potentiometer.

Overload: Short-circuit protected.

Output Current: 50 mA, limited at approximately 75 mA.

Noise, 0.1 Hz to 1 MHz: 1 mV rms.

Line Regulation: ±0.01% for ±5% line variation.

Load Regulation: ±0.01% ±3 mV no load to full load.

Output Stability, 30 days: Within 0.02% ±0.01%/°C.

Output Impedance: 0.1 Ω maximum.

BRIDGE CONDITIONING

Bridge Balance: 20-turn potentiometer. Terminals for balance-limit resistor. Front-panel LEDs indicate balance or offset direction.

Bridge Completion: Terminals for completion of ¼, ½, and full bridges.

Calibration: 3-position switch: Plus Shunt CAL, Minus Shunt CAL, and Operate. Terminals accept CAL resistor.

POWER, ENVIRONMENT, DIMENSIONS

Amplifier: ±16 V at 18 mA plus amplifier and excitation load currents. Operating voltage supplied by the enclosure.

Enclosures: 120/240 V ac, 50 Hz to 60 Hz.

Operating Environment: 0°C to 50°C, 90% RH.

Storage Temperature: –25°C to +71°C.

Dimensions (Amplifier): 133 mm (5.25″) H × 23.3 mm (0.9″) W × 203 mm (8″) D.

OPTIONS, ENCLOSURES, AND ACCESSORIES

FILTER AND OUTPUT OPTIONS

(One option, J through N, must be specified.)

OPTION	WIDEBAND OUTPUT	FILTERED OUTPUT
J (Single Output)	10 mA	None
K (Single Output)	100 mA	None
L (Dual Output)	10 mA	10 mA
M (Dual Output)	100 mA	10 mA
N (Dual Output)	10 mA	100 mA

Filter Characteristic: Two-pole Bessel, –3 dB low pass.

Selectable Filter Frequencies: 10 Hz, 100 Hz, 1 kHz, 10 kHz plus a wideband position.

High-current Output: ±10 V, 100 mA, short-circuit protected.

ENCLOSURES

Compatibility: The E513 Series enclosures are designed to work with both Models 560H and 563H. All enclosures include a 120/240 V ac power supply.

E513-2A: Two-unit enclosure. Includes barrier strip for all inputs/outputs.

E513-6A: Six-unit enclosure. Includes rear-panel connectors with mates for all inputs.

R513-16: Rack-mount enclosure accepts up to 16 Model 563H units. Includes rear panel connectors with mates for all inputs.

ACCESSORIES

516-503-40: Single-channel Filler Panel

516-503-55: Four-channel Filler Panel

560-501-01: Extender Board

For price and delivery information, please contact the factory or the Ectron representative in your area.

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Specifications subject to change without notice.

Represented by: