

FE-859-TA

AC/DC programmable transducer amplifier



The FE-859-TA is a fully programmable Transducer Amplifier in modular presentation designed for Wheatstone bridge type signals and offers low noise AC or DC coupled wide bandwidth amplification.

Additionally, the amplifier may be enhanced by use of the FE-859-HA, a rack mount Head Amplifier which plugs into the system rear panel to give single-ended and differential charge, and ICP® capability.

Computer control includes gain from x1 to x2500, Constant Voltage source energisation with remote sensing for full or fractional bridges; low noise balanced, dynamic Constant current (CI) source energisation for single gauge application, input calibration, shunt calibration, output calibration, Auto-Zero activation and AC/DC coupling.

Featuring a microprocessor controlled 14 bit non-volatile digital auto-zero system, the module also provides a Butterworth low pass filter which may be frequency programmed by resistor network and selected by use of an internal jumper.

The amplifier offers high gain accuracy, stability and linearity, high common mode rejection and wide dynamic range.

The input, which features a change over system to allow an external calibration source to be applied, is protected against excessive normal or common mode voltages. The dual output buffers are proof against indefinite short circuit.

The rack controller, type FE-705-SB, or FE-707-EC will control up to 16 amplifiers. In addition, it is possible to connect a single amplifier directly to a computer serial port.

Power requirement is 207-253V AC or alternative 103-127V a.c. 50/60Hz. 11-14V DC power may be utilised by fitment of an FE-605-DCC converter.

Description

The FE-859-TA is a fully programmable Transducer Amplifier in modular presentation designed for strain gauge signals both full and fractional and offers low noise AC or DC coupled wide bandwidth amplification. Remote sensing constant voltage and low noise, balanced dynamic constant current for single gauge working are included. The amplifier features 2 independent output buffer amplifiers.

Programmable features include gain from x1 to x2500, source energisation value, input calibration, shunt calibration, output calibration, AC / DC coupling, Constant Voltage or Constant Current excitation and Auto-Zero activation.

The amplifier may be extended by use of the FE-859-HA, which enables ICP, single-ended and differential charge transducers to be connected.

Specification

INPUT	resistance offset voltage current A.C. coupling indication protection filter voltage drift voltage noise calibration indication	DC coupled $>10^9 \Omega$. AC coupled 4M Ω (differential). 200 μ V typical. <10 pA. -3dB @ 1.6Hz changeover relay for AC/DC selection. LED indicator. ± 30 V protection. capacitors limit high frequency noise. <10 μ V / $^{\circ}$ C (2 μ V / $^{\circ}$ C typical). 13 μ V pk. - pk. referred to input (note 1). changeover relay allows injection of calibration voltage (note 3). LED illuminates for calibration setting.
GAIN	steps error (any step) stability	1, 2, 5, 10, 20, 50, 100, 200, 500, 1k, 2k5. <0.2%. better than 0.02% / $^{\circ}$ C.
COMMON MODE	rejection	Typ.90 dB DC - 1kHz (± 10 V) (D.C. coupled). >80 dB @50 Hz (A.C. coupled).
FREQUENCY	response	DC to 80kHz (- 3dB).
FILTER	response setting range	3 pole Butterworth selectetd by internal jumper. programmable via plug-in resistor network 47Hz to 47kHz.
BRIDGE	supply CV sensing CI compliance selection indication accuracy, CV or CI current max. calibration auto zero manual balance	2V5, 5V, 10, 12 V. (Noise 10 μ V pk-pk DC to 10kHz). remote or local, compliance allows up to 2V drop in line at 10V 5mA, 10mA, 20mA, 24mA. (Noise 30nA pk-pk 1Hz to 10kHz). allows up to 10V drop for (eg) zener barriers and line (350 Ω @20mA). changeover relay for CV / CI selection. Led indicator $\pm 0.2\%$. CV 35mA, s/c protected. shunt - 3 selections. 14 bit digital voltage correction, will correct \pm full scale to typ. <5 mV in less than 1 second. Will store last zero setting. (D.C. coupled operation only). 15 turn shunt balance control and internal RBAL resistor balances transducers outside AZ correction range.
OUTPUT	2 identical parallel output stages noise / offset impedance protection calibration	< 1mV pk. - pk. (note 1) / $\leq \pm 10$ mV <0.1 Ω (note 2) continuous short circuit. output voltage injection - 1 selection.
STATUS	indicator	Module health LED indicator normally lit; will extinguish following an auto-zero operation if balance requirement is out of range or on reception of an illegal command.
CONTROL	Module	FE-707-SB Serial controller, or FE-707-EC Ethernet controller.

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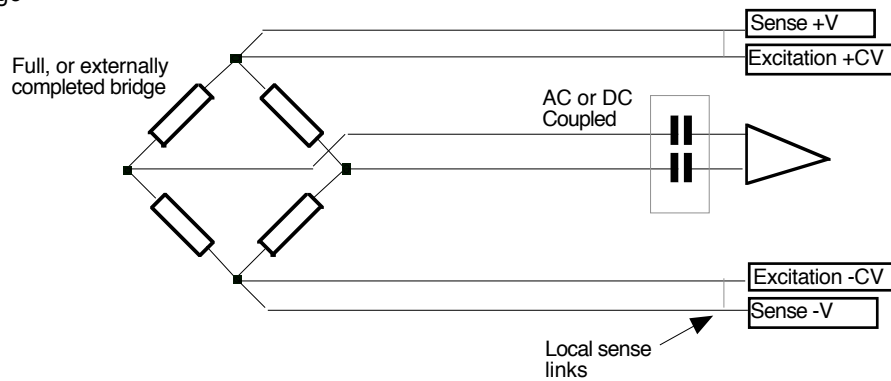
POWER SUPPLY		207V-253 V 50Hz or 103V-127V 50/60Hz. 11-15VDC by fitment of FE-605-DCC D.C./D.C. converter.
ENVIRONMENTAL	temperature range	0°C to 50°C storage. 0°C to 35°C operating. 14°C to 28°C to specification.
DIMENSIONS		panel 3U x 5HP, pcb 160 mm x 100 mm. DIN 41612 (C Body) edge connector.
PROGRAMMING		A.C. or D.C. coupling Gain setting Constant Voltage or Constant Current transducer supply Bridge supply Voltage or Current level Input calibration (or selection of FE-859-HA - note 3) Shunt calibration Output calibration Auto-zero activation Serial Number readback
RACK CONTROLLER		FE-705-SB or FE-707-EC module fits in 17th slot. Serially interfaced.

- Notes
1. Measurement bandwidth 100kHz.
 2. Module only, excluding backplane wiring and rear panel connectors.
 3. When used with FE-859-HA, input calibration not available.

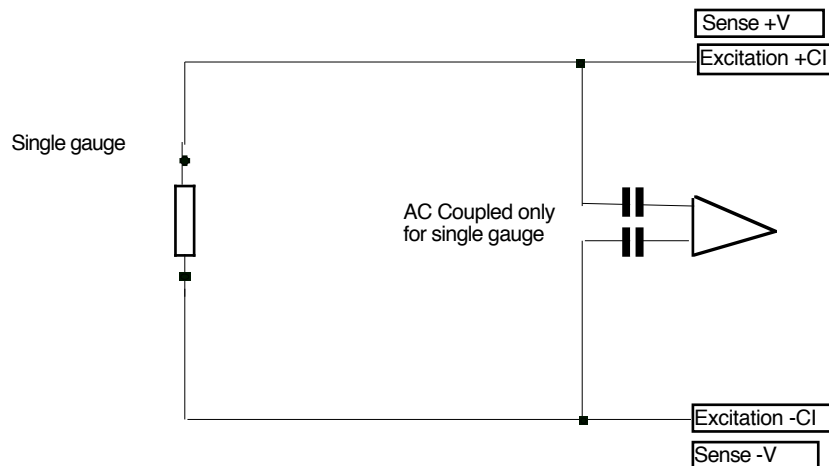
APPLICATION

Supply can be remotely programmed to be either Constant Voltage (CV) or Constant Current (CI). Capability may be enhanced by use of FE-859-HA, in-rack Head Amplifier for Diff and SE Charge, and ICP

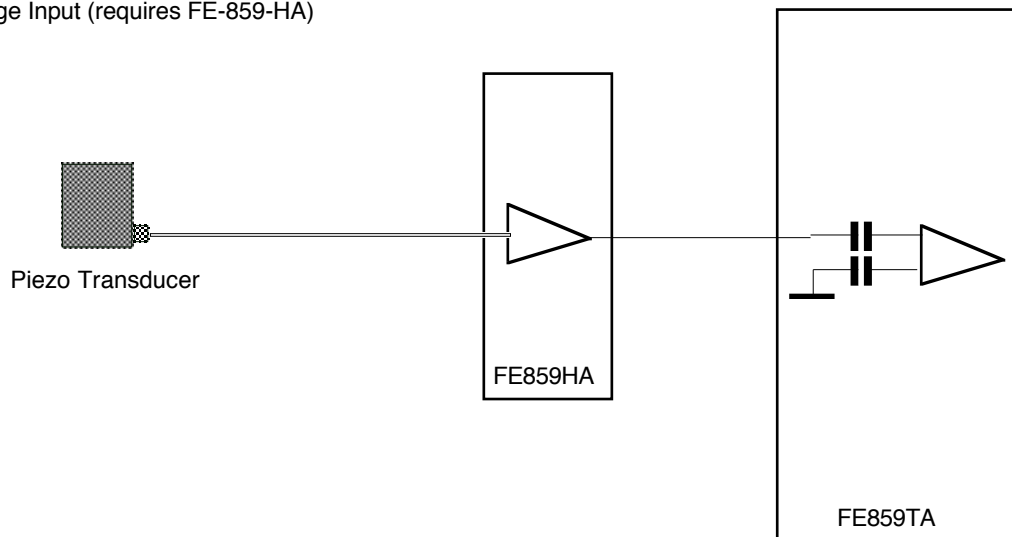
1. Constant Voltage



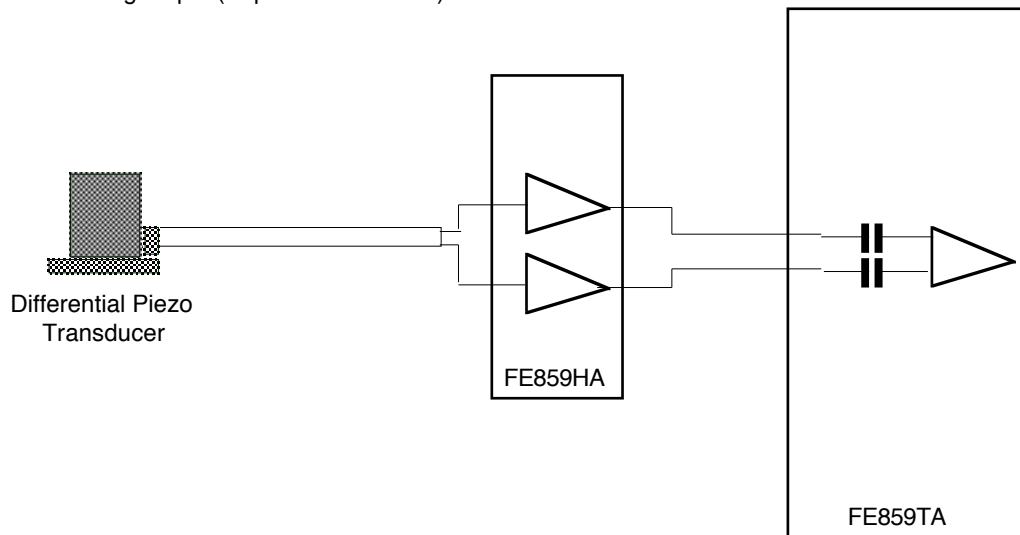
2. Constant Current



3. Charge Input (requires FE-859-HA)



4. Differential Charge Input (requires FE-859-HA)



5. ICP Input (requires FE-859-HA)

