

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.

Computer control via RS232 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.

A serial rack controller, the FE-705-SB, 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.

Specification

INPUT	resistance	DC coupled $>10^9$. AC coupled 4M (differential).
	offset voltage	200 μ V typical.
	current	<10 pA.
	A.C. coupling	-3dB @ 1.6Hz changeover relay for AC/DC selection.
	indication	LED indicator.
	protection	± 30 V protection.
	filter	capacitors limit high frequency noise.
	voltage drift	$<10\mu$ V / $^{\circ}$ C (2 μ V / $^{\circ}$ C typical).
	voltage noise	13 μ V pk. - pk. referred to input (note 1).
	calibration	changeover relay allows injection of dynamic calibration voltage.
indication	LED illuminates for calibration setting.	
GAIN	steps	1, 2, 5, 10, 20, 50, 100, 200, 500, 1k, 2k5.
	error (any step)	$<0.2\%$.
	stability	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).
	response	DC to 80kHz (- 3dB).
FREQUENCY	response	DC to 80kHz (- 3dB).
FILTER	response	3 pole Butterworth selectetd by internal jumper.
	setting range	programmable via plug-in resistor network 47Hz to 47kHz.
BRIDGE	supply CV	2V5, 5V, 10, 12 V. (Noise 10 μ V pk-pk DC to 10kHz).
	sensing	remote or local, compliance allows up to 2V drop in line at 10V
	CI	5mA, 10mA, 20mA. (Noise 30nA pk-pk 1Hz to 10kHz).
	compliance	allows up to 10V drop for (eg) zener barriers and line (350 @20mA).
	selection	changeover relay for CV / CI selection.
	indication	Led indicator
	accuracy, CV or CI	$\pm 0.2\%$.
	current max.	CV 35mA, s/c protected.
	calibration	shunt - 3 selections.
	auto zero	14 bit digital voltage correction, will correct \pm full scale to typ. <5 mV in less than 1 second. Will store last zero setting.
manual balance	(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	< 1 mV pk. - pk. (note 1) / $<\pm 10$ mV
	impedance	<0.1 (note 2)
	protection	continuous short circuit.
	calibration	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-705-SB Serial controller
	Internal Bus	Internal opto isolated serial bus to each amplifier; module data transfer by checksummed packets with acknowledge.

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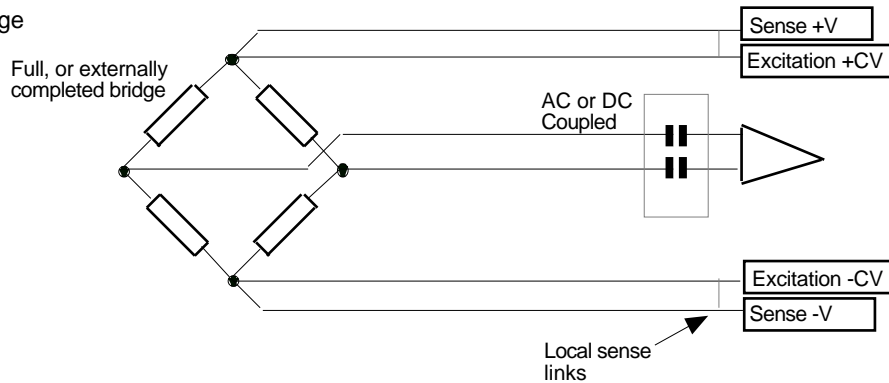
POWER SUPPLY		207V-253 V 50Hz or 103V-127V 50/60Hz. 11-15VDC by fitment of FE-605-DCC D.C./D.C. converter.
ENVIRONMENTAL	temperature range	0°C to 50°C storage. 0°C to 35°C operating. 14°C to 28°C to specification.
DIMENSIONS		panel 3U x 5HP, pcb 160 mm x 100 mm. DIN 41612 (C Body) edge connector.
PROGRAMMING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

- Notes
1. Measurement bandwidth 100kHz.
 2. Module only, excluding backplane wiring and rear panel connectors.

POWER SUPPLY APPLICATION

Supply can be remotely programmed to be either Constant Voltage (CV) or Constant Current (CI).

1. Constant Voltage



2. Constant Current

