



Transconductance Amplifier

- Extends Calibrator Currents to 11A DC & AC rms
- Slave Mode Programmable from 4708, 4700 & 4705
- Solo Mode Operation for General Application
- AC Performance from 10 Hz to 20 kHz

A significant proportion of lower performance bench and handheld DMMs are capable of measuring currents of 10A or more. In the interests of traceability and operator safety, these instruments require calibration at these higher current levels. The model 4600 Transconductance Amplifier provides a rugged, compact solution, capable of extending the current sourcing capabilities of Datron Calibrators to 11A DC or rms AC, and may also be used with other suitable voltage sources. When used with a compatible model 4708, 4700 or 4705, it provides a fully integrated solution, being transparently controlled by the calibrator.

Solo Mode

Working on the principle of converting a voltage input to a current output, the 4600 has a transfer characteristic of 1 Amp per Volt for both DC and AC, and may be coupled to any appropriate volt-

age source. With 90 day, $\pm 1^\circ\text{C}$ specifications of the order of 100 ppm for DC currents and 300ppm for AC, a sufficient margin of calibration accuracy is assured over the performance of bench and handheld DMMs.

Slave Mode

When used with a compatible model 4708, 4700 or 4705, two cables connect the Transconductance Amplifier to the Calibrator. The first is fully shielded and carries the analog voltage from the rear panel of the Calibrator to the 4600's rear panel, while a digital cable carries control signals between them. The 10A range of the Calibrator is automatically enabled when the 4600 is present, and the user is then able to program the required current output from the Calibrator's front panel, or remotely via its IEEE-488 interface.

Calibration

For use in the solo mode, where the Calibrator has no control over the amplifier, there are a series of easily accessible trim pots to allow periodic recalibration of the 4600's circuitry. The slave mode, however, eliminates the need for any mechanical adjustments during the recalibration process, as it utilizes the Autocal technique resident within Datron Calibrators.

SPECIFICATIONS

DC CURRENT

Accuracy Relative to Voltage Source:

90 days, $23^\circ\text{C} \pm 1^\circ\text{C}$:

$\pm(50 \text{ ppm Output} + 500 \mu\text{A})$.

Temperature Coefficient ($23^\circ\text{C} \pm 10^\circ\text{C}$):

7 ppm/ $^\circ\text{C}$.

Compliance: $>2\text{V}$.

AC CURRENT

Accuracy Relative to Voltage Source:

90 days, $23^\circ\text{C} \pm 1^\circ\text{C}$:

10 Hz - 1 kHz: $\pm(200 \text{ ppm Output} + 1.1 \text{ mA})$

1 kHz - 5 kHz: $\pm(700 \text{ ppm Output} + 1.4 \text{ mA})$

5 kHz - 10 kHz: $\pm(1400 \text{ ppm Output} + 6 \text{ mA})$

10 kHz - 20 kHz: $\pm(0.54\% \text{ Output} + 33 \text{ mA})$

Temperature Coefficient ($23^\circ\text{C} \pm 10^\circ\text{C}$):

$< 5 \text{ kHz}$: 10 ppm/ $^\circ\text{C}$; $> 5 \text{ kHz}$: 50 ppm/ $^\circ\text{C}$

Total Harmonic Distortion:

0.1% (10 Hz-1 kHz); 0.5% (1k-5 kHz);

1.0% (5k-10 kHz); 1.5% (10k-20 kHz).

Compliance: $>2\text{Vrms}$.

Scale Length: 9% to 110% of range.

GENERAL

Compatibility: Slave Mode compatible with all 4700 series calibrators equipped with firmware of issue 5.0 and above.

Input Impedance: 300 k Ω & 100 pF.

Isolation: 100V pk, I- to Chassis.

Output Protection: Fully protected against open circuit outputs.

Input Protection: 1.1kV DC or rms AC (10 sec), 240V DC or rms AC (continuous).

Calibration: Trim pots (Solo mode), Autocal from front panel or IEEE-488 interface of host calibrator (Slave mode).

Environmental:

Operating temperature: 0°C to $+50^\circ\text{C}$.

Storage temperature: -40°C to $+70^\circ\text{C}$.

Dimensions: 89 mm (3.5 in.) high; 455 mm (17.9 in.) wide; 420 mm (16.5 in.) deep.

Weight: 10 kg (22 lb).

Power: 100/120/220/240 VAC $\pm 10\%$, 50 or 60 Hz. Consumption 200W.

OPTIONS & ACCESSORIES

80: 115V 60 Hz Line Operation.

81: 115V 50 Hz Line Operation.

90: Rack Mounting Kit.

440151: Slave Mode Lead Kit.

440154: Current Output Lead Kit.

FACTORY/FOB

Indianapolis, IN & Norwich, England

ORDER INFORMATION

Model 4600	\$4,995
Options 80, 81	NC
Option 90	\$75
Accessory 440151	\$350
Accessory 440154	\$60