

Trig-Tek™

203G8

Charge Amplifier

User Manual

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FOR YOUR SAFETY

Before undertaking any troubleshooting, maintenance or exploratory procedure, read carefully the **WARNINGS** and **CAUTION** notices.



CAUTION
RISK OF ELECTRICAL SHOCK
DO NOT OPEN



This equipment contains voltage hazardous to human life and safety, and is capable of inflicting personal injury.



If this instrument is to be powered from the AC line (mains) through an autotransformer, ensure the common connector is connected to the neutral (earth pole) of the power supply.



Before operating the unit, ensure the conductor (green wire) is connected to the ground (earth) conductor of the power outlet. Do not use a two-conductor extension cord or a three-prong/two-prong adapter. This will defeat the protective feature of the third conductor in the power cord.



Maintenance and calibration procedures sometimes call for operation of the unit with power applied and protective covers removed. Read the procedures and heed warnings to avoid “live” circuit points.

Before operating this instrument:

1. Ensure the proper fuse is in place for the power source to operate.
2. Ensure all other devices connected to or in proximity to this instrument are properly grounded or connected to the protective third-wire earth ground.

If the instrument:

- fails to operate satisfactorily
- shows visible damage
- has been stored under unfavorable conditions
- has sustained stress

Do not operate until performance is checked by qualified personnel.

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Chapter 1

Introduction

The 203G8 Charge Amplifier (**Figure 1-1**) is a versatile Charge Amplifier covering the frequency range from 2 Hz to 50,000 Hz. It accepts pickups with sensitivities varying from 1 to 110 pC/g. It has three simultaneous outputs of 100 mV RMS/PK g, Velocity with a sensitivity of 534 mV RMS/PK/IN/Sec, and Displacement with a sensitivity of 100 mV/MIL DA. A five-position RANGE switch selects 1, 3.0, 10, 30.0 or 100 full scale meter ranges with a variable 0.5 to 1.5 Volts RMS control for the full scale AC (Tape) output.

A plug-in meter assembly provides for three High Pass Filters, and three Low Pass Filters with 48 dB/oct roll offs. Either a CAL-OPER switch or a REMOTE selected switch connects the Charge Amplifier input to either the CALIBRATE or the ACCEL input. An overload light and alarm circuit is provided to alert for input overload, or if a preset level exceeded.

The Charge Amplifier is packaged in a plug-in module. Up to six of these modules plug into a standard 19-inch rack, seven inches high. A single cabinet is also available.

Features include:

- Modular package
- 1-110 mV-pC/g input
- Simultaneous Accel, Vel, Displ AC outputs
- 3 HP and 3 LP 48 db/oct filters
- Overload indicator
- Alarm circuit
- Selectable meter
- Inline filter
- 0.5-1.5 V RMS calibrated FS AC output

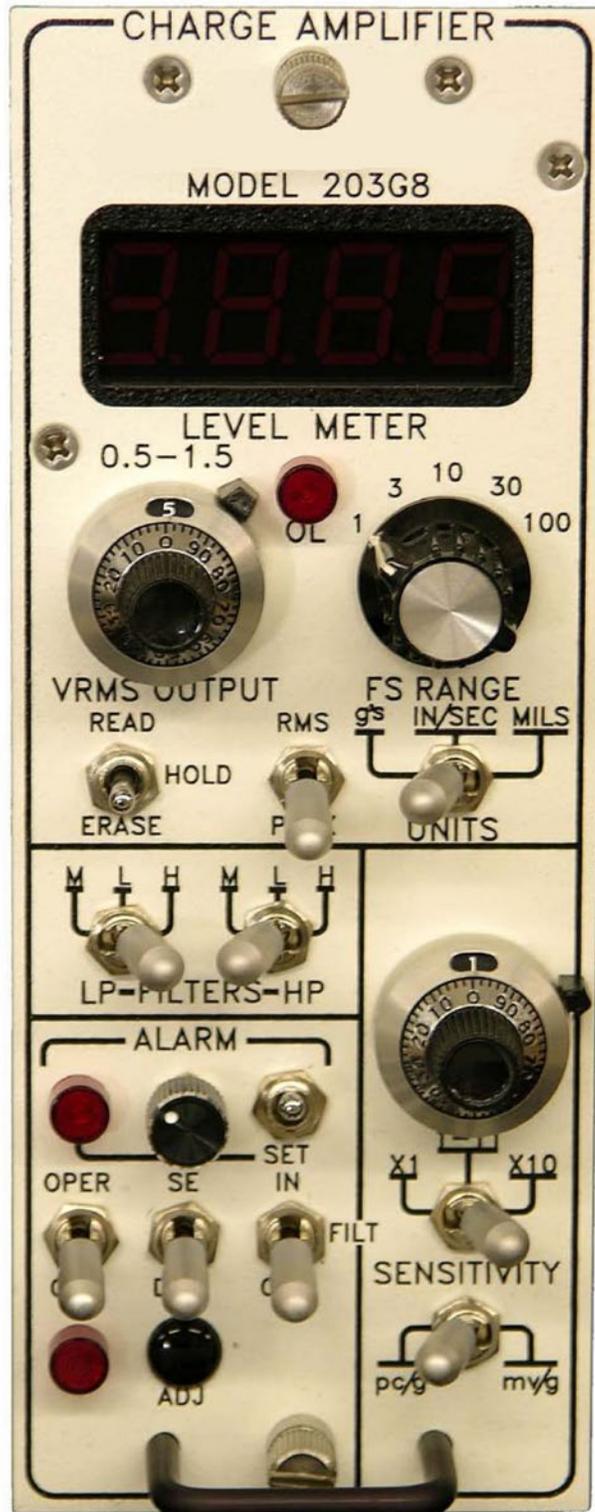


Figure 1-1, 203G8 Charge Amplifier

Description

The 203G8 Charge Amplifier is a versatile Charge Amplifier covering the frequency range from 2 Hz to 50,000 Hz. It accepts pickups with sensitivities varying from 1 to 110 pC/g, and provides an output of 100 mV RMS/PK g, and double-integrates the input signal to provide Velocity output with a sensitivity of 354 mV RMS/PEAK IN/SEC, and a Displacement output with a sensitivity of 100 mV RMS/MIL DA. A plug-in filter assembly provides for three High Pass and three Low Pass filters. Both the High pass and Low Pass filters have 48 dB/oct roll offs. A CAL-OPER switch or rear panel command connects the Charge Amplifier input to either the CALIBRATE or the ACCEL input. The 203G8 operates with high temperature accelerometers where pyroelectric effects may be encountered.

The 203G8 is packaged in a plug-in module. Up to six of these modules plug into a standard 19-inch rack, seven inches high. A single-module cabinet is also available.

Figure 1-2 shows a block diagram of the circuit operation.

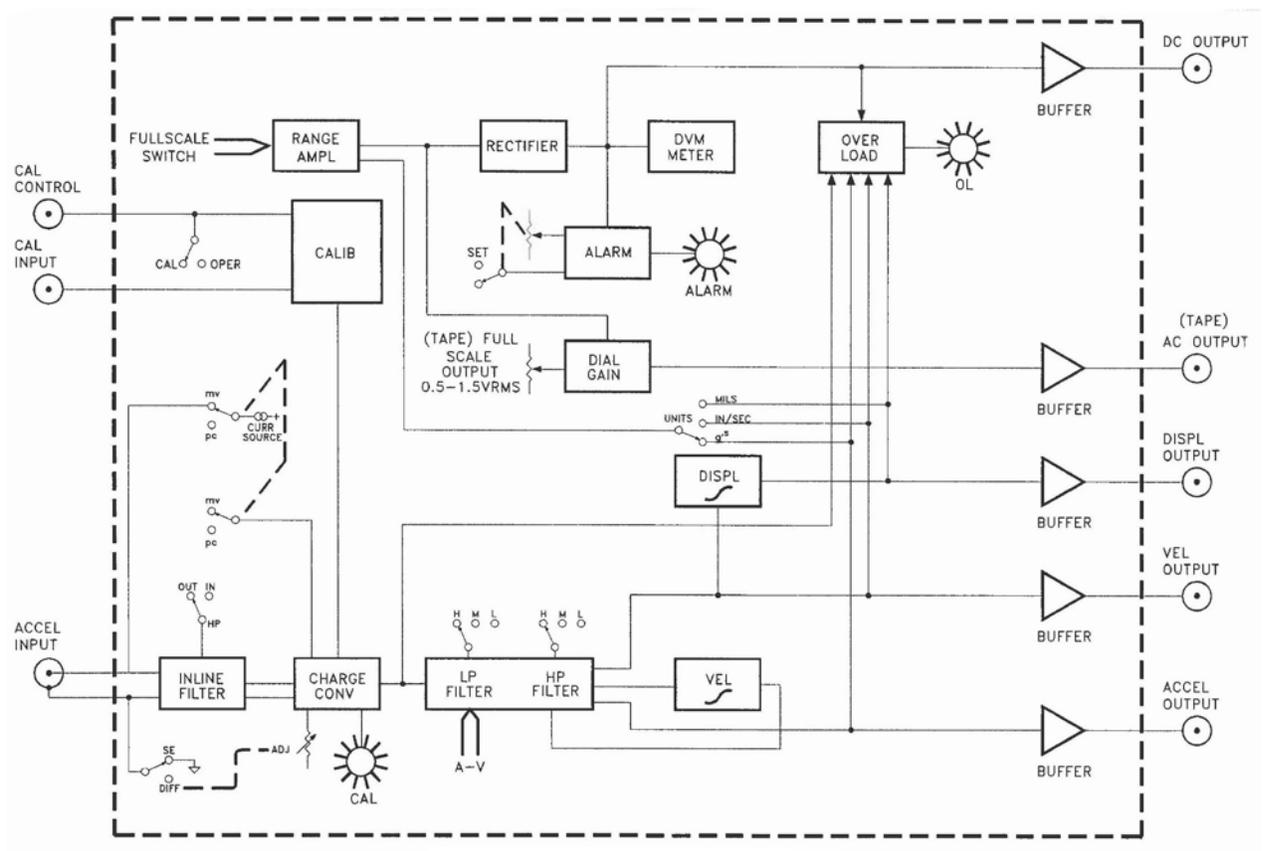


Figure 1-2, 203G8 Charge Amplifier, Block Diagram

Specifications

Input

Charge Sensitivity	1 to 110 pC/g (provided with two selectable ranges); 1-11 and 10-110 pC/g with continuous adjustment for each.
Frequency Response	2% from 5 Hz to 30,000 Hz referred to 100 Hz.
Overload Recovery	15,000 pC or less, 1 ms half sine input pulse will cause no effect at the output, except clipping.
Amplitude (Stability vs. Input Capacity)	Less than 0.1% change per 1000 pF.
Amplitude (Stability Temperature)	Less than 3% change from 30° to 130°F.
Shunt Resistance	Will operate with any input impedance above 100 k ohms.

Acceleration Output (NOR)

Voltage (max)	10 Volts RMS.
Sensitivity	100 mV RMS/PEAK g.
Impedance	Less than 50 Ohms (10 mA max).
Amplitude Linearity	±1% of best straight line approximation of output vs. input amplitude.
Amplitude Accuracy	±2% of reading ±1% of FS in series with selected Low Pass Filter.
Noise	0.05 pC maximum with 1.0 pC/g sensitivity. Noise increases 0.006 g/1000 pF of additional capacity at the input.
Harmonic Distortion	Less than 1%.
DC Offset	Less than 5 millivolts.

Velocity Output

Voltage (Max)	10 Volts RMS.
Sensitivity	354 mV RMS/PEAK IN/SEC.
Impedance	Less than 50 Ohms (10 mA max.)
Amplitude Accuracy vs. Frequency	$\pm 3\%$ 25 Hz to 3000 Hz of a -6 dB/oct slope, in series with the selected input Low Pass Filter.
DC Offset	Less than 5 millivolts.

Displacement Output

Level	0–10 Volts RMS.
Sensitivity	10 mV RMS/MIL PK-PK.
Impedance	Less than 50 Ohms (10 mA max.)
Amplitude Accuracy vs. Frequency	$\pm 4\%$ 30 Hz to 1000 Hz of a -12 dB/oct slope. $\pm 5\%$ 25 Hz to 3000 Hz of a 12 dB slope in series with the selected Low Pass filter.
DC Offset	Less than 5 millivolts.

Full scale AC Output (Tape)

Level	A variable 0.5 to 1.5 Volts RMS for selected full scale meter range.
Impedance	Less than 50 Ohms (10 mA max.)
Frequency Response	$\pm 3\%$ for acceleration, $\pm 4\%$ for velocity; $\pm 5\%$ for displacement.
Linearity	$\pm 1\%$ full scale.
DC Offset	Less than 4 millivolts.

Full scale DC Output

Impedance	Less than 50 Ohms (10 mA max.)
Sensitivity	10 Volts for selected meter full scale.
Linearity	$\pm 1\%$ full scale.
Amplitude Accuracy	$\pm 2\%$ of reading $\pm 1\%$ FS for Acceleration, $\pm 4\%$ of reading $\pm 1\%$ FS for Velocity; $\pm 5\%$ of reading $\pm 1\%$ FS of Displacement.
Dynamic Range (Accel)	50 dB below full scale.

Controls

CAL-OPER Switch	Connects the amplifier input to either the CALIBRATE signal or to the ACCEL Input jack.
PC/g-mV/g Switch	mV/g is a voltage amplifier to accommodate accelerometers with built-in electronics, pc/g accommodates standard accelerometers
Sensitivity Switch	Selects X1 or X10 sensitivity.
Sensitivity Dial	Adjust the charge sensitivity from 1-11 for either the X1 or X10 sensitivity range.
HP-LP Filter	Filters are plug-in Assy 3089 (see Table 2-1 at the end of Operations Chapter 2).
LP Filter Switch (3089-1)	Selects HIGH (10 kHz), MED (2 kHz), or LOW (300 Hz) -5% cutoff frequencies; 48dB/oct roll off.
HP Filter Switch (3089-1)	Selects HIGH (300 Hz), MED (110 Hz), or LOW (20 Hz) 05% cutoff frequencies, 40dB/oct roll off.
UNITS Switch	Selects PEAK g's, PEAK IN/SEC, or DA MILS as the meter units.
FULLSCALE Switch	Selects 1, 3.0, 10, 30.0 or 100 units as full scale for the meter and full scale outputs.
ALARM SET Switch	Provides a means of monitoring the alarm set point, also RESETS the alarm.
SE-DIFF Switch	Selects single-ended or differential input configuration.
IN-OUT FILTER Switch	When in the IN position, places a Low Pass filter in series with the input (pC/g mode only).

Indicators

Panel Meter	3-1/2 digit panel meter indicating the level of the selected units.
OL Light	Illuminates when the input level overdrives a circuit.
CAL Light	Illuminates when CAL mode is selected.
ALARM Light	Illuminates when the alarm set point is exceeded.

Power

	115 or 203 V RMS, 50-400 Hz, 110 Volts nominal
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Size

	7 in. high x 2.7 in. wide x 13 in. deep.
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Chapter 2

Operation

The 203G8 Charge Amplifier (**Figure 1-1**) is in a modular package with a self-contained power supply. Insert the amplifier into one of the six-rack spaces of a six-module rack or the single-module cabinet.

CAUTION

This module can be operated with either 115 or 230V RMS power controlled by S1 on the main board in the module. Before applying power, place the switch to the proper setting. Applying the 230V RMS with the switch set for 115V RMS could cause damage to the unit.

The power for the rack is controlled by the POWER switch on the left-hand side; place this switch to **POWER**.

Input Switch

The 203G8 is designed to accept inputs from either standard charge type pickups or from integrated types with the electronics built in. Place the INPUT switch to pC/g for standard charge type pickups and to mV/g for integrated pickups. When this switch is in the mV/g position, a 1 to 8 mA current output is supplied to operate the pickup electronics. Connect the pickup to the ACCEL input jack (BNC connector) at the rear of the rack.

Level Meter

The Level Meter is a 3-1/2 digit meter that monitors the input level. It has five ranges 1, 3, 10, 30, or 100 units, and a switch to select Acceleration g's, Velocity IN/SEC, or Displacement MILS.

OL Light

The OL Light is a RED LED which illuminates if the input signal causes any circuit to overload. The overload light is monitoring the charge amplifier ahead of the low pass filter, the acceleration, velocity, displacement and the DC output.

Units Switch

The UNITS switch selects g's, IN/SEC, or MILS DA as the UNITS to be displayed on the front panel meter and the DC OUTPUT jack.

RMS-PEAK Switch

The RMS-PEAK switch provides a means of scaling the circuits to read in either PEAK or RMS units at the input. When the input to the unit is sinusoidal, it may be desirable to indicate in peak g's. When the input is random noise, the RMS position scales the meter to indicate RMS units, and because the detector is a true RMS converter, it will indicate either sinusoidal or random inputs correctly in RMS units.

Fullscale Switch

The FULLSCALE switch has five positions to select 1, 3, 10, 30, or 100 units fullscale. The DC OUTPUT is 10 Volts fullscale for each range.

FS Output Control

The FS Output Control is a calibrated dial to set a known fullscale output, for the selected range. The dial sets from 0.5 to 1.5 Volts RMS at the FULLSCALE (TAPE) Output, for the range selected.

Sensitivity Control

The Sensitivity control is a calibrated ten-turn potentiometer to provide a continuously variable sensitivity for each range selected by the SENSITIVITY RANGE switch.

Sensitivity (Range) X1 or X10 Switch

The two-position SENSITIVITY switch is the range selector for the variable sensitivity control. The proper range selection and sensitivity control setting allows using pickups from 1 to 110 pC/g or mV/g sensitivities. Place this switch to the range the pickup sensitivity falls in, 1-11 to 10-110. For instance, if the pickup is 20 pC/g, the X10 range is selected and the dial set to 2.0.

SE-DIFF Switch (pC/g mode only)

This switch permits selection of a single-ended input (SE) or Differential input (DIFF). If operating with a pickup that is insulated (no ground) the single-ended (SE) position should be used. When the pickup common is grounded the Differential (DIFF) input opens the ground path between the pickups and the amplifier and provides rejection of the common mode voltage.

OPER-CAL Switch

The OPER-CAL switch selects the input of the charge converter to either the ACCEL input when in OPER, or the CALIBRATOR input when in the CAL position. The CAL input to the charge converter is 1 V RMS for fullscale CAL. When the OPER-CAL switch is in the OPER position, the calibrate mode can be selected by the remote CAL CONTROL input. When the CAL mode is selected, either by the front panel switch or the remote CAL CONT line, the CAL LIGHT just to the right of the switch will illuminate.

LP Filter Switch

The LP Filter (low pass filter) switch has three positions marked L (LOW), M (MED), and H (HIGH). The -5% cutoff frequencies are determined by selected filter (See **Table 2-1**, 3089 Filter Assemblies Chart used for 203 Charge Amplifier at the end of this chapter). These filters have a 48 dB/oct roll off. Other cutoffs can be provided.

HP Filter Switch

The HP FILTER (High Pass Filter) switch has three positions marked L (LOW), M (MED), and H (HIGH). (See **Table 2-1**, **3089 Filter Assemblies Chart** at the end of this chapter.)

Hold Circuit

The HOLD Circuit has a center OFF switch with a momentary READ and ERASE positions. The HOLD circuit stores the highest level encountered during a test, and this value can be displayed on the meter by depressing the momentary READ position of the switch. The HOLD circuit can be restored to zero by depressing switch to momentary ERASE.

Alarm

The ALARM circuit has a SET switch, a light, and a SET ADJ control associated with it. When the SET switch is depressed (momentarily), the SET ADJUST is connected to the meter to indicate what level the alarm is set for. While the switch is depressed, the alarm levels can be changed by varying the screwdriver adjustment and noting the new value on the front panel meter. When released, the alarm is reset, the light is out, and it will remain thus until a level is encountered which is higher than the Alarm Set Level. When the higher level is encountered, the ALARM light will illuminate and the alarm will be energized. The contacts of the alarm relay are on a terminal strip on the rear panel. It should be noted that the alarm level is interconnected through the METER RANGE switch. For instance, if 8 g's is set on the 10 g range, it will be 80 g's if the 100 g range is selected.

**Table 2-1, 3089 Filter Assemblies
(Used for 203 Charge Amplifier)**

FILTER	LOWPASS			HIGHPASS				
3089	Not used			Not used				
3089-1*	300Hz	2kHz	10kHz		20Hz	110Hz	300Hz	5%
3089-2	2kHz	10kHz	50kHz		20Hz	110Hz	150Hz	5%
3089-3	2kHz	10kHz	40kHz		5Hz	110Hz	150Hz	5%
3089-4	300Hz	2kHz	10kHz		20Hz	110Hz	3kHz	5%
3089-5	800Hz	2kHz	10kHz		20Hz	110Hz	500Hz	5%
3089-6	300Hz	2kHz	10kHz		20Hz	110Hz	300Hz	5%
3089-7	300Hz	2kHz	10kHz		5Hz	110Hz	300Hz	5%
3089-8**	60kHz	70kHz	80kHz		20kHz	25kHz	30kHz	5%
3089-9	2kHz	10kHz	40kHz		5Hz	150Hz	300Hz	5%
3089-10#	65Hz	70Hz	3kHz		10Hz	15Hz	25Hz	-3dB
3089-11##	165Hz	170Hz	3kHz		25Hz	105Hz	110Hz	-3dB
3089-12	5Hz	10kHz	30kHz		5Hz	30Hz	75Hz	5%
3089-13	Not Available							
3089-14	300Hz	2kHz	10kHz		40Hz	70Hz	110Hz	5%
3089-15	700Hz	2kHz	20kHz		110Hz	500Hz	1kHz	5%
3089-16	450Hz	2kHz	10kHz		3Hz	70Hz	110Hz	5%
3089-17	2kHz	10kHz	20kHz	5%	5Hz	200Hz	300Hz	-3dB
3089-18	300Hz	800Hz	2kHz	5%	110Hz	300Hz	500Hz	5%
3089-19	3kHz	10kHz	30kHz	-3dB	5Hz	70Hz	110Hz	5%

* Standard for 203G8

** Used in 550P

Used in 203G-1 with 5Hz Integ Filter

Used in 203G8-2 with 25Hz Integ Filter

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Chapter 3

Performance Test

This procedure outlines a method of testing the 203G8 Charge Amplifier for compliance with the manufacturer's specifications. The 203G8 may be in a single unit cabinet or one that holds 6 units. The following procedure is for a single unit, and must be repeated for each module. In the event that a reading is out of tolerance the unit will require calibration (see **Chapter 4, Calibration Procedure**).

Test Equipment

Note: *Equivalent test equipment can be substituted.*

AC-DC Voltmeter

Keithley 191

Function Generator

Trig-Tek 346B Calibrator

Switch Settings

Place the CALIB-OPER switch to OPER, the SENSITIVITY switch to X10, the mV/g-pC/g switch to mV/g, the SE-DIFF switch to SE, the UNITS switch to g's, the RANGE switch to 100, the PEAK-RMS switch to RMS, the LP FILTER switch to HIGH, the IN-OUT FTLTER switch to OUT, and the HP FILTER switch to LOW. Turn the SENS dial to 10.0 and the FS Output Dial to 15.0. Connect the power cord of the rack assembly into the power line and turn the POWER switch at the left side of the rack to ON.

Performance Test Procedure

1. Connect a 100 ± 5 Hz signal with a level of 707 ± 4 millivolts RMS to the ACCEL INPUT connector.
2. Connect the AC Voltmeter to the ACCEL OUTPUT jack.
3. Observe a 707 ± 14 millivolts RMS indication on the AC voltmeter.
4. Place the RMS-PEAK switch to PEAK.
5. Observe a 1000 ± 20 millivolts RMS indication on the AC voltmeter.
6. Place the SENSITIVITY switch to X1 position.
7. Observe a 10.0 ± 0.2 Volts RMS indication on the AC voltmeter. The front panel would indicate 100 ± 3 .
8. Connect the DC voltmeter to the DC OUTPUT jack.
9. Observe a 10.00 ± 0.3 Volts indication on the DC voltmeter.
10. Connect the AC voltmeter to the FULLSCALE (TAPE) OUTPUT, and place the FS OUTPUT dial to 15.0
11. Observe a 1.50 ± 0.05 Volts RMS indication on the AC voltmeter.
12. Place the FS OUTPUT dial to 5.0.
13. Observe a 500 ± 15 millivolts RMS indication on the AC voltmeter.
14. Set the generator level for 211 ± 1 millivolts RMS, and place the RANGE switch to 30.
15. Observe a 10.00 ± 0.3 Volts indication on the DC voltmeter. The front panel should indicate 30.0 ± 0.9 g.
16. Reduce the generator level to 70.7 ± 0.4 millivolts RMS, and place the RANGE switch to 10.
17. Observe a 10.00 ± 0.3 Volt indication on the DC voltmeter. The front panel should indicate 10.00 ± 0.3 g.
18. Place the sensitivity switch to X10, and place the RANGE switch to 1.
19. Observe a 10.00 ± 0.3 Volts indication on the DC voltmeter. The front panel should indicate 1.000 ± 0.03 g.
20. Set the generator for a 707 ± 4 millivolts RMS signal of 61.4 ± 0.2 Hz.
21. Place the UNITS switch to IN/SEC, the SENS switch to 10, and the RANGE switch to 10.
22. Connect the AC Voltmeter to the VEL OUTPUT jack, and set the HP FILTER switch to LOW.
23. Observe a 3.54 ± 0.1 Volts RMS indication on the AC voltmeter. The front panel should indicate 10.0 ± 0.3 IN/SEC.
24. Set the generator for 139.9 ± 0.2 Hz, and place the UNITS switch to MILS. Connect the AC voltmeter to the DISPL OUTPUT jack.

25. Observe a 1.00 ± 0.04 Volts RMS indication on the AC voltmeter. The front panel should indicate 10.0 ± 0.4 MILS.
26. Place the UNITS switch to g's, the RANGE switch to 10 g, the HP FILTER switch to MEDIUM, and the CALIB-OPER switch to CALIB. (The CALIB light should illuminate).
27. Connect the generator to the CALIB INPUT jack, and set it for approximately 150 Hz and a level of 1.00 ± 0.01 Volt RMS.
28. Place the SENS switch to X1 and dial to 10.0.
29. Observe a 10.00 ± 0.30 g indication on the front panel meter.
30. Place the SENS switch to X10.
31. Observe a 10.00 ± 0.30 g indication on the front panel meter
32. Place the RMS-PEAK switch to RMS.
33. Observe a 10.00 ± 0.30 g indication on the front panel meter.
34. Set the SENS dial to 1.00.
35. Observe a 10.00 ± 0.30 g indication on the front panel meter.

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Chapter 4

Calibration Procedure

The 203G8 Charge Amplifier is a plug-in module with the circuitry on a single printed circuit. To calibrate, remove the module and use the Module Power Cord Assembly TT-1535 to apply power and PCB Assy TT-1536 to provide an interface for monitoring. For adjustment location, refer to (**Figure 4-1, Switch and Resistor Adjustment Locations**).

The 203G8 uses all solid state parts with the latest integrated circuitry. When operate in a 30 to 120 degrees F environment, a one year calibration period is recommended.

Test Equipment

Note: Equivalent test equipment can be substituted.

AC-DC Digital Voltmeter	Keithley 191
Function Generator	Trig-Tek 346B Synthesized Calibrator
Power Cord Assy	Trig-Tek TT-1535
Printed Circuit Connector Board Assy	Trig-Tek TT-1536

Switch Settings

1. Place the CALIB-OPER switch to OPER, the SENS switch to X10, the mV/g-pC/g switch to pC/g, the SE-DIFF switch to SE, the UNITS switch to g's, the RANGE switch to 100, the PEAK-RMS switch to RMS, the LP FILTER switch to HIGH, the IN-OUT FILTER switch to OUT, and the HP FILTER switch to LOW.
2. Turn the Sensitivity Dial to 10.0 and the FS Output Dial to 1.50.
3. Place the module to be tested on the bench, and plug the Printed Circuit Connector Board Assy TT-1536 to the printed board connector at the rear of the module, and the Power Cord Assy TT-1535 to the power receptacle.
4. Connect the 50 to 400 Hz 115 Volt power.

Charge Converter

1. Connect the AC voltmeter to Pin 8 of P1. (ACCEL OUTPUT of the Connector Board Assembly).
2. Connect a 100 \pm 5 Hz signal with a level of 707 \pm 4 millivolts RMS to the ACCEL

INPUT connector.

3. Set the ACCEL ADJ R4 for a 707 ± 4 millivolts RMS indication on the AC Voltmeter.
4. Place the RMS-PEAK switch to PEAK.
5. Place the SENSITIVITY switch to X10 and set the Dial for 1.0.
6. Set the DIAL ADJ R2 for a 10.00 ± 0.05 Volts RMS indication on the AC voltmeter.

Meter and Output Scaling

1. Short the ACCEL INPUT BNC. Verify that the HIGH PASS filter is in LOW.
2. Place the SENSITIVITY switch to XI, the DIAL to 10.00, the RANGE switch to 100, and the UNITS switch to g's.
3. Connect the DC voltmeter to Pin 13 of PI. DC OUTPUT of the Connector Board Assy.).
4. Set the ZERO ADJ R15 for a 0 ± 4 millivolts RMS indication on the DC voltmeter.
5. Connect a 707 ± 4 millivolt RMS signal (1000 millivolts PK) at 61.4 ± 0.2 Hz to Pin 17 of P1 (ACCEL INPUT of the Connector Board Assy.)
6. Set the ACCEL M ADJ R9 for a 10.00 ± 0.05 Volts indication on the DC voltmeter.
7. Set the DVM FS ADJ (on the indicator board of the DVM) for a 100.0 ± 0.5 g indication on the front panel DVM.
8. Set the generator for level for 2120 ± 10 mV RMS (3000 mV PK).
9. Set the SENSITIVITY switch to X10.
10. Place the RANGE switch to 30.
11. Set the X3 ADJ R1 (on board behind the front panel meter) for a 30.0 ± 0.1 g.
12. Place the RANGE switch to 10. Connect the AC voltmeter to Pin 10 of P1 (VEL OUTPUT of the Connector Board Assy). Set the generator for 707 ± 1 mV RMS (1000 mV PK). Verify that the front panel meter indicates 10.00 ± 0.05 g's.
13. Set the VEL FS ADJ R18 for a 3.54 ± 0.02 Volt RMS indication on the AC voltmeter.
14. Place the UNITS switch to IN/SEC.
15. Set the VEL M ADJ R10 for an indication of 10.0 ± 0.5 IN/SEC on the front panel meter.
16. Set the generator for 139.9 ± 0.2 Hz.
17. Connect the AC voltmeter to the Displ Output Pin 11 of P1 (DISPL OUTPUT of the Connector Board Assy.)

18. Set the DISPL FS ADJ R19 for a 1000 ± 5 mV RMS indication on the AC voltmeter.
19. Place the UNITS switch to MILS.
20. Set the DISPL M ADJ R11 for 10.00 ± 0.05 MILS on the front panel meter.

FS Output Adjustments

1. Place the RANGE switch to 100, the UNITS switch to g's. The 0.5-1.5 dial to 15.0, and the SENSITIVITY switch to X1.
2. Check for 707 ± 4 millivolts RMS level and approximately 150 Hz at the ACCEL INPUT jack.
3. The front panel meter should indicate 100 ± 1 g.
4. Connect the AC voltmeter to the FULLSCALE (TAPE) OUTPUT (Pin 7 of P1).
5. Set the FS ADJ R20 for a 1.500 ± 0.05 volts RMS indication on the AC voltmeter.
6. Place the FS OUTPUT dial to 5.0.
7. Set the FS DIAL ADJ R1 for a 500 ± 2 millivolts RMS indication on the AC voltmeter.
8. Adjustment of R20 and R1 will interact, return to 1.5 and 0.5 on the FS OUTPUT dial and repeat until the proper readings are obtained.

Calibration Adjustments

1. Place the UNITS switch to g's, the RANGE switch to 10 g, and the CALIB-OPER switch to CALIB. (The CALIB light should illuminate).
2. Connect the generator to the CALIB INPUT Pin 5 of P1.
3. Set the generator frequency for approximately 150 Hz and the level for 1.00 ± 0.01 volts RMS.
4. Place the SENSITIVITY switch to X1 and the Dial to 10.0.
5. Set the X1 ADJUST R8 for 10.00 ± 0.10 g indication on the front panel meter.
6. Set the Dial for 1.00.
7. Set the Dial CAL ADJ R3 for a 10.00 ± 0.05 g indication on the front panel meter.

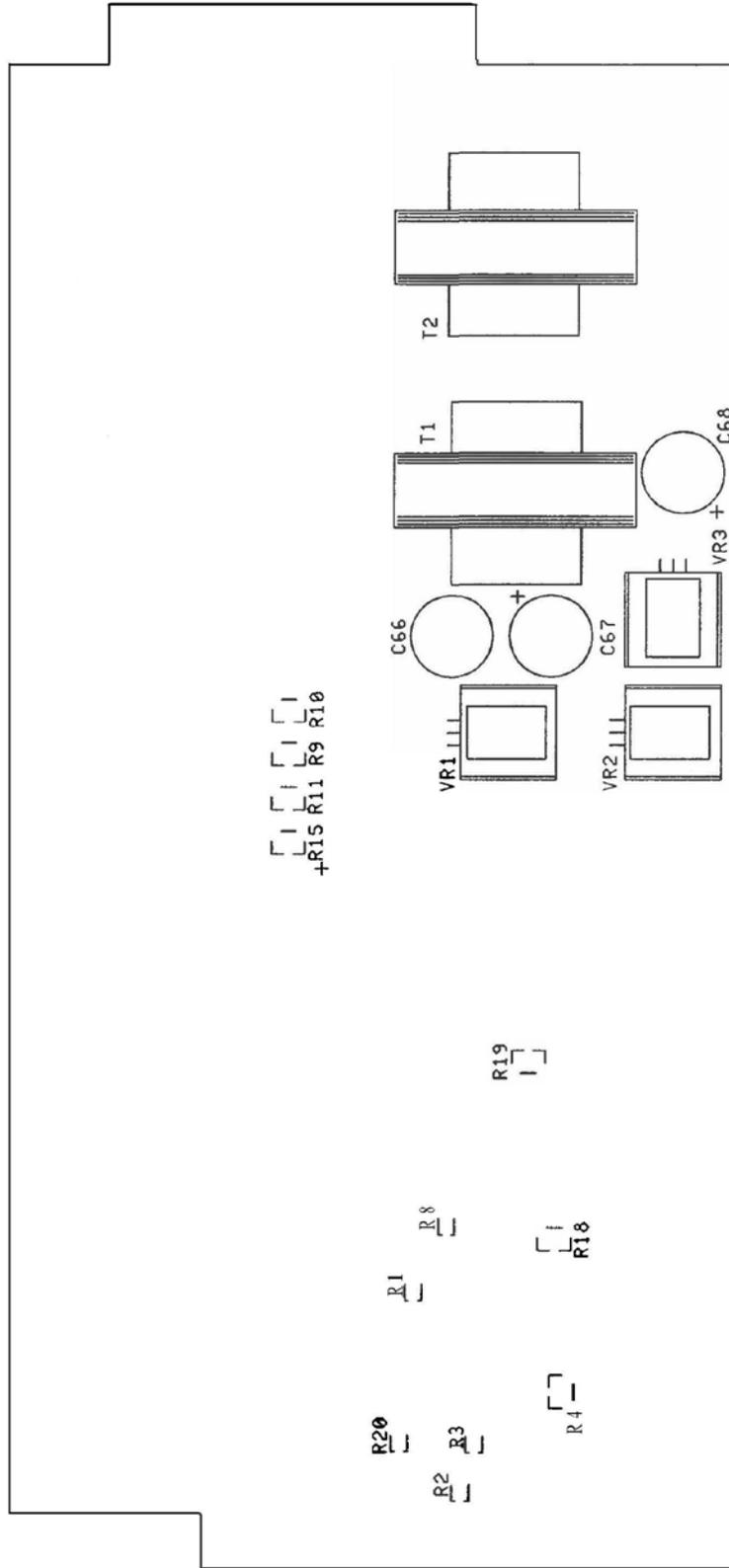


Figure 4-1, Switch and Resistor Adjustment Locations