



# Trig-Tek™

# 203PC-1, -2

## Charge Amplifier

The Trig-Tek™ 203PC-1, -2 charge amplifiers operate with high temperature accelerometers where pyroelectric effects may be encountered.

### Key Features

- pC or mV mode
- Accel or Vel input
- High-Pass and Low-Pass Filters
- Overload detection
- Six Full Scale (FS) ranges
- DVM indicator
- 0.1 to 199.9 input sensitivity
- AA, AV, AD, VV, VD
- 115 or 230 V<sub>rms</sub> power

### Product Information

The Trig-Tek™ 203PC-1 and 203PC-2 cover the frequency range from 3 Hz to 40,000 Hz. They double-integrate the 10 g acceleration output signal to provide velocity and displacement outputs.

A four-position thumb-wheel sensitivity control in conjunction with a three-position toggle switch accommodates pickups having sensitivities from 0.100 to 199.9 pC/g, mV/g, or mV/ips. A “Mode” switch selects “pC/g” (“AA,” “AV,” or “AD”), “mV/g” (“AA,” “AV,” or “AD”), or “Vel” (VV or VD).

The DC output switch selects “X1” or “X10” for g’s, ips, or MILs at the “DC Output.” An external “Cal” signal can be selected by a front panel switch or by the “Cal” control input (rear panel).

A Low-Pass Filter has 100 Hz to 19.9 kHz cutoff frequencies in 100 Hz steps, and a High-Pass filter has 1 to 999 Hz cutoff frequencies in 1 Hz steps.

A digital front-panel meter displays selectable Full Scale (FS) levels of “10,” “20,” “50,” “100,” “200,” or “500” g’s Pk or “1,” “2,” “5,” “10,” “20,” or “50” ips or MILS Pk.

The 203PC is packaged as a plug-in module. Available are a single-module chassis and a six-module chassis.

When “mV/ips” is selected, the amplifier will operate with ICP-type velocity pickup with the “Curr-On” or with a standard velocity pickup with the “Curr-Off.”

A “DC Output” switch permits selection of either “X1,” “X10,” “10 mV/g,” or “100 mV/ips” or MIL at the “DC Output.”

An “External Cal” signal can be selected by the front panel “Mode”/“Units” switch or by the “Cal” control input (rear panel).

An internal switch has three positions: “A,” “V,” and “Out.” In the “A” position, it places the Low-Pass Filter in the acceleration before the velocity integrator path.

In the “V” position, it places the filter behind the velocity integrator path.

In the “Out” position, there is no filter.

A second internal switch marked “V,” “D,” and “DC” will place the High-Pass Filter at the velocity output for “V,” at the displacement output for “D,” and in the DC path in the “DC” position.

The unit has overload circuits to alert if FS Pk levels are exceeded.

# Specifications

Note: The Astronics Test Systems policy is one of continuous development and improvement. Consequently, the equipment may vary in detail from the description and specifications in this publication.

## Input

### Connector

- BNC or 3-Pin PT02A

### Charge Sensitivity

- 0.1 to 199.9 pC/g or mV/g with three selectable range: "X.1," "X1," and "X10"

### Frequency Response

- $\pm 3\%$  from 5 Hz to 40,000 Hz referred to 100 Hz (filters "Out")

### Overload Recovery

- 100% overdrive of a 1 ms half Sine input pulse will cause no effect at the output except clipping.

### Amplitude (Stability vs. Temperature)

- $< 2\%$  change from 30° to 130° F

### Amplitude (Stability vs. Input Capacity)

- $< 0.1\%$  change per 1,000 pF

### Shunt Resistance

- Will operate with any input impedance above 200 k $\Omega$

### Filtering – Low Pass

- 48 dB/oct or greater roll-off with cutoffs selectable from 100 Hz to 20 kHz in 100 Hz steps

### Filtering – High Pass

- 48 dB/oct roll-off from 5 Hz to 999 Hz in 1 Hz steps

## Acceleration Output

### Voltage (max)

- 10 V<sub>rms</sub>

### Sensitivity

- 203PC-1: 10 mV<sub>rms</sub>/Pk g
- 203PC-2: 10 mV/g

### Impedance

- $< 25 \Omega$  (10 mA max)

### Maximum Capacity for FS

- 0.033  $\mu$ F
- Output at 20 kHz

### Amplitude Linearity

- $\pm 1\%$  of best straight line approximation of output vs. Input amplitude

### Amplitude Accuracy (Frequency Response)

- $\pm 2\%$  of reading  $\pm 1\%$  of FS in series with selected filter

### Noise

- 0.05 pC maximum with 1.0 pC/g sensitivity. Noise increased 0.006 g/1000 pF of additional capacity at the input

### Harmonic Distortion

- $< 1\%$

### DC Offset

- $< 10$  mV

### Connector

- (18-Pin) PT024-14-18S and BNC

## Velocity Output

### Voltage Max

- 10 V<sub>rms</sub>

### Sensitivity

- 203PC-1: 100 mV<sub>rms</sub>/Pk ips
- 203PC-2: 100 mV ips

### Impedance

- $< 25 \Omega$  (10 mA max)

### Maximum Capacity for Fullscale output at 2 kHz

- 0.33  $\mu$ F

### Frequency Response

- $\pm 3\%$  25 Hz to 3,000 Hz of a -6 dB/oct slope, in series with any selected filtering (plug-in capability will be provided to extend low-end response to 5 Hz)

### DC Offset

- $< 10$  mV

### Connector

- (18-Pin) PT02A-14-18S and BNC

## Displacement Output

### Level

- 0 to 10 V<sub>rms</sub>

### Impedance

- $< 5 \Omega$

### Sensitivity

- 203PC-1: 100 mV<sub>rms</sub>/Pk MIL
- 203PC-2: 100 mV/MIL (Pk-Pk)

### Maximum Capacity for FS output at 2 kHz

- 0.33  $\mu$ F

### Frequency Response

- $\pm 3\%$  30 Hz to 1,000 Hz of a -12 dB slope
- $\pm 5\%$  25 Hz to 3,000 Hz of a -12 dB slope in series with the selected Low-Pass filter (plug-in resistor capability will be provided to extend low end response to 5 Hz)

### DC Offset

- $< 10$  mV

### Converter

- (18-Pin) PT02A-14-18S and BNC

## DC Output

### Level

- 13 VDC max

### Impedance

- $< 25 \Omega$  (10 mA max)

### Sensitivity

- 10 or 100 mV/Pk g; or 0.1 or 1 V/Pk ips or MILS as selected by the "Mode"/"Units" switch and the "DC Output" switch

### Linearity

- $\pm 1\%$  FS

### Amplitude Accuracy

- Accel:  $\pm 2\%$  of reading  $\pm 1\%$  FS
- Vel:  $\pm 4\%$  of reading  $\pm 1\%$  FS
- Displ:  $\pm 5\%$  of reading  $\pm 1\%$  FS

### Dynamic Range

- Accel: 50 dB below FS
- Vel: 50 dB below FS
- Displ: 50 dB below FS

### Connectors

- (18-Pin) PT02A-14-18S and (3-Pin) PT02

## FS AC Output

(Optional)

### Level

- 10 V<sub>rms</sub> for FS setting

### Impedance

- $< 50 \Omega$  (10 mA max)

### Configurations

- "SE" or "DIFF" selected by a Jumper JP1 on the main board

### Linearity

- $\pm 1\%$  of best straight line from zero to FS measured in 1000 Hz

### Connector

- Isolated BNC

## Controls

### High-Pass Filter Switch

- Three-section thumb switch selects 1 to 999 Hz cutoff frequencies: 48 dB/oct Butterworth High-Pass Filter

### Low-Pass Filter Switch

- Three-section thumb switch selects from 0.1 to 19.9 kHz cutoff frequencies: 48 dB/oct or greater Butterworth Low-Pass Filter in 100 Hz steps

## Specifications

continued

### Variable Pre & Post Low-Pass Filter Adj (A5 – W30A)\*

- Sets variable frequency cutoffs (R1 on A5-W30A)

### Mode/Units switch

- Selects input modes “pC/g,” “mV/g,” “mV/ips” or “Cal”; and the meter and DC input units “AA,” “AV,” “AD,” “VV,” or “VD”

### Multiplier Input Range Switch

- Selects “X.1,” “X1,” or “X10” multiplier for 1.00 to 19.99 pC/g, mV/g, or mV/ips sensors

### Sensitivity Switch

- Selects charge sensitivity from 1.00 to 19.99 for each range, selected by the multiplier switch

### FS Switch

- The FS switch has six positions, which work in conjunction with the input “Mode” switch. In the “AA” mode, it provides FS of “10,” “20,” “50,” “100,” “200,” or “500” g. In the “AV” or “AD” mode, it provides FS of “1,” “2,” “5,” “10,” “20,” or “50” ips or MIL. The unit also has overload circuits to alert if FS levels are exceeded.

### SE-ISO-DIFF Switch (“On-Curr-Off”)

- In “pC/g” mode, selects single-ended, isolated, or differential configuration at the input
- In the “mV/g” or “mV/ips” modes, selects “Curr,” “On,” or “Off”

### DIFF BAL Adj (A7-W18A)\*

- Sets the balance on the DIFF Input (R2 on A7-W18A)

### ISO Adj (A7-W18A)\*

- Adjustment to optimize the common mode rejection when using the “ISO” input mode (R1 on A7-W18A)

### In-Line Filter – L, M, H Switch

- “L” 5 kHz cutoff
- “M” 10 kHz cutoff
- “H” 20 kHz cutoff
- Jumper on PC Board marked S4 “In-Out” to switch filter on or off

## Indicators

### DVM

- 3½ digital panel meter indicating g’s, ips, or MILS

### Cal Light (“Red”)

- Illuminates when the “Cal” mode is selected, either local or remote

### Overload (OL) LEDs (4 each “Red”)

- Accel, Vel, Displ or DC illuminates when parameter is overloaded

### Mode LED (3 “Green”)

- Mode selected “pC/g,” “mV/g,” or “mV/ips” LED illuminates

### Multiplier DP LED (3 “Yellow”)

- Selected DP illuminates

## Power

- 120 or 240 V<sub>rms</sub>, 50 to 400 Hz, 100 W nominal

## Dimensions

- 7” H x 2.7” W x 13” D; up to six units mounted side by side in standard 19”-wide rack

\*Factory Adjust

## Ordering Information

### 408301-001 : Trig-Tek™ 203PC-1

Charge Amplifier with pk displacement

### 408301-002 : Trig-Tek™ 203PC-2

Charge Amplifier with pk displacement

### Accessories:

4112 : 6-slot chassis with 3-pin connectors

4114 : 6-slot chassis

4175 : 6-slot chassis with multi-pin connectors (**Mature**)

4120 : Single-slot chassis

