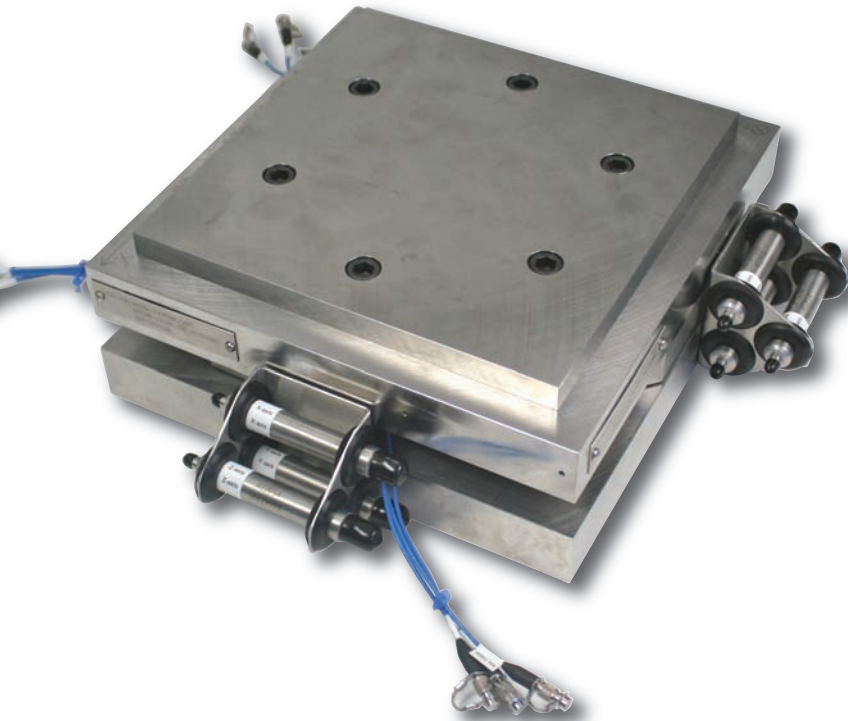


In-line ICP® Powered Charge Converters

Tips from Techs

Polarity of Charge Converters

The output signal polarity of PCB® charge output sensors is negative. Because of this, most external charge converters, like the 422E Series, are designed to have an inverting characteristic. Therefore, the resulting system, sensor with charge converter, will have an output signal polarity that is positive.



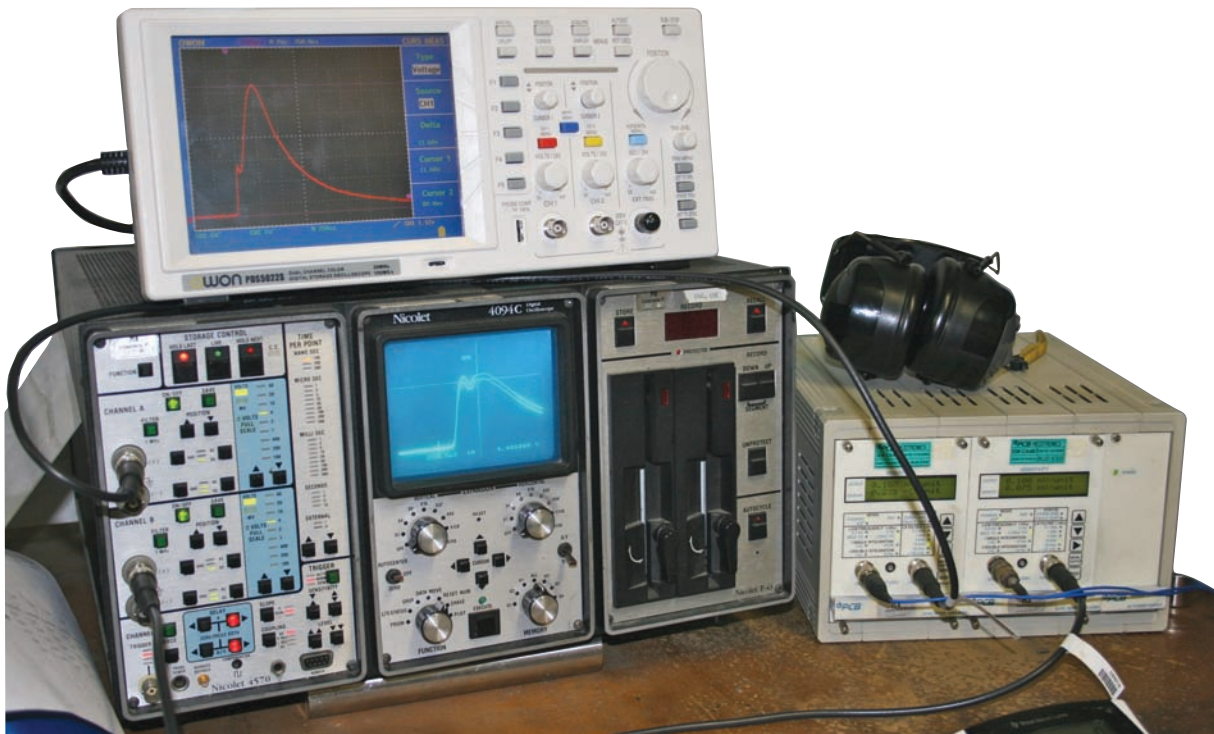
In-Line ICP®-Powered Charge Converters



Model Number	422E51	422E52	422E53	422E55	422E54
Gain (Charge Conversion Sensitivity)	100 mV/pC (±5%)	10 mV/pC (±2.5%)	1 mV/pC (±2.5%)	0.5 mV/pC (±2.5%)	0.1 mV/pC (±2.5%)
Input Range	±50 pC	±500 pC	±5000 pC	±10,000 pC	±50,000 pC
Output Voltage Range	±5.0 V	±5.0 V	±5.0 V	±5.0 V	±5.0 V
Frequency Response (+/-5%) [1]	5 to 100k Hz	5 to 100k Hz	5 to 100k Hz	5 to 50k Hz	5 to 50k Hz
Broadband Electrical Noise [2]	49 µV rms	33 µV rms	33 µV rms	33 µV rms	33 µV rms
Temperature Range	-65 to +250 °F -54 to +121 °C	-65 to +250 °F -54 to +121 °C	-65 to +250 °F -54 to +121 °C	-65 to +250 °F -54 to +121 °C	-65 to +250 °F -54 to +121 °C
Excitation Voltage	18 to 28 VDC	18 to 28 VDC	18 to 28 VDC	18 to 28 VDC	18 to 28 VDC
Constant Current Excitation	2 to 20 mA	2 to 20 mA	2 to 20 mA	2 to 20 mA	2 to 20 mA
Input Connector	10-32 Jack	10-32 Jack	10-32 Jack	10-32 Jack	10-32 Jack
Output Connector	BNC Jack	BNC Jack	BNC Jack	BNC Jack	BNC Jack
Size	3.4 x 0.52 in 86 x 13 mm	3.4 x 0.52 in 86 x 13 mm	3.4 x 0.52 in 86 x 13 mm	3.4 x 0.52 in 86 x 13 mm	3.4 x 0.52 in 86 x 13 mm
Weight	1.15 oz 32.7 gm	1.15 oz 32.7 gm	1.15 oz 32.7 gm	1.15 oz 32.7 gm	1.15 oz 32.7 gm
Additional Versions					
0.5 Hz (-5%), ±2.5 V Output, CE	422E01	422E02	422E03	422E05	422E04
± 2.5 V Output, CE	422E11	422E12	422E13	422E15	422E14
TEDS, ±2.5 V Output, CE	T422E11	T422E12	T422E13	T422E15	T422E14
Miniature Size, TEDS [3]	—	T422E93/A	T422E92/A	—	T422E91/A

Notes
 [1] High frequency response may be limited by supply current and output cable length [2] Typical, tested using voltage source and input capacitor equal to the feedback capacitor, to simulate a charge output sensor [3] Units are 1.6 x 0.25 in (length x diameter) (40 x 6.4 mm) with 10-32 jack connectors

In-line ICP® Powered Charge Converters



In-Line ICP®-Powered Charge Converters

	 			 	
Model Number	422E36	422E35	422E38	422E66/A	422E65/A
Type	High Temp. Aps [1]	High Temp. Aps [1]	High Temp. Aps [1]	Rad. Hard. Aps [2]	Rad. Hard. Aps [2]
Gain (Charge Conversion Sensitivity)	10 mV/pC ±2%	1 mV/pC ±2%	0.1 mV/pC ±2%	10 mV/pC ±2%	1 mV/pC ±2%
Input Range	±250 pC	±2500 pC	±25,000 pC	±500 pC	±5000 pC
Output Voltage Range	±2.5 V	±2.5 V	±2.5 V	±5.0 V	±5.0 V
Frequency Response (+/-5%) [3]	5 to 100k Hz	5 to 100k Hz	5 to 100k Hz	10 to 90k Hz	5 to 100k Hz
Broadband Electrical Noise [4]	26 µV rms	14 µV rms	14 µV rms	17 µV rms	7 µV rms
Temperature Range	-65 to +250 °F -54 to +121 °C	-65 to +250 °F -54 to +121 °C	-65 to +250 °F -54 to +121 °C	-65 to +250 °F -54 to +121 °C	-65 to +250 °F -54 to +121 °C
Excitation Voltage	18 to 28 VDC	18 to 28 VDC	18 to 28 VDC	18 to 28 VDC	18 to 28 VDC
Constant Current Excitation	2.2 to 20 mA	2.2 to 20 mA	2.2 to 20 mA	2 to 20 mA	2 to 20 mA
Input Connector	10-32 Jack	10-32 Jack	10-32 Jack	10-32 Jack	10-32 Jack
Output Connector	BNC Jack	BNC Jack	BNC Jack	10-32 Jack	10-32 Jack
Size	3.4 x 0.52 in 86 x 13 mm	3.4 x 0.52 in 86 x 13 mm	3.4 x 0.52 in 86 x 13 mm	3 x 0.5 in 76 x 13 mm	3 x 0.5 in 76 x 13 mm
Weight	1.1 oz 31 gm	1.1 oz 31 gm	1.1 oz 31 gm	0.8 oz 23 gm	0.8 oz 23 gm
Additional Version					
TEDS	T422E36	T422E35	—	—	—
Notes	[1] Specifically designed for use with sensors operating in elevated temperature, greater than +400 °F (+204 °C) [2] Specifically designed for use in radiation environments [3] High frequency response may be limited by supply current and output cable length [4] Typical, tested using voltage source and input capacitor equal to the feedback capacitor, to simulate a charge output sensor				



In-line Voltage Follower Amplifiers

Impedance Converters and In-line Voltage Follower Amplifiers Series 402

Series 402A In-line voltage follower amplifiers, similar to the Series 422E charge converters, serve to convert charge output sensor signals to low-impedance voltage signals. They are recommended for applications requiring high frequency response up to 1 MHz, and for applications where sensor output (pC/unit) exceeds the maximum input range (pC) allowed in the Series 422E.

The voltage sensitivity, V , of a system including a charge output sensor, low-noise cable and voltage follower amplifier can be determined mathematically by the equation $V=Q/C$ where Q is the charge sensitivity of the sensor in Coulombs and C is the total system capacitance in Farads. The total system capacitance is the result of the sum of the capacitance of the sensor, the capacitance of the interconnect cable, and the input capacitance of the voltage amplifier. Choose a voltage follower amplifier with an input capacitance that provides the sensitivity desired, while keeping the total output voltage (range x sensitivity) within the ± 10 volt limit. Voltage follower amplifiers do not invert the polarity of the measurement signal.

In-line Voltage Follower Amplifiers



Model Number	402A	402A02	402A03
Voltage gain ($\pm 2\%$)	0.98	0.98	0.98
Output Range	± 10 V	± 10 V	± 10 V
Input Capacitance	< 8.0 pF	$100 \pm 10\%$ pF	$1000 \pm 10\%$ pF
Discharge Time Constant	1.0 second	10 second	100 second
Frequency Response ($\pm 5\%$) [1]	0.5 to 1M Hz	0.05 to 1M Hz	0.005 to 1M Hz
Broadband Noise	43 μ V rms	43 μ V rms	43 μ V rms
Output Bias	8 to 13 V	8 to 13 V	8 to 13 V
Temperature Range	-65 to +250 °F -54 to +121 °C	-65 to +250 °F -54 to +121 °C	-65 to +250 °F -54 to +121 °C
Power Required	18 to 28 VDC	18 to 28 VDC	18 to 28 VDC
Constant Current Required	2 to 20 mA	2 to 20 mA	2 to 20 mA
Input Connector	10-32 jack	10-32 jack	10-32 jack
Output Connector	10-32 jack	10-32 jack	10-32 jack
Size (Length x Diameter)	1.17 x 0.25 in 30 x 6 mm	1.17 x 0.25 in 30 x 6 mm	1.17 x 0.25 in 30 x 6 mm

Notes

[1] High frequency achieved at 20 mA excitation

Hochwertige Messtechnik und Beratung aus einer Hand



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