

Signal Conditioners

Highlights

- Battery powered
- Line powered
- Multi-purpose
- Modular-style
- Multi-channel
- Charge & impedance converters
- Industrial charge amplifiers & sensor simulators



Battery Powered Signal Conditioners for ICP® Sensors

Battery Powered ICP® Sensor Signal Conditioners

Battery powered signal conditioners offer portable, convenient methods for powering ICP® sensors and conditioning their output signals for transmittal to readout and recording instruments. Most

units operate, and are supplied, with standard 9 volt alkaline batteries. Each features a color-coded input circuit check-out meter to alert of proper sensor turn-on or input fault due to open or short-circuit connections. Optional rechargeable versions are equipped with NiCad batteries and supplied with an AC powered recharger unit.



CE

Model 480C02
Unity gain, low- noise, high frequency



CE

Model 480E09
Gain x1, x10, x100



CE

Model 480B21
3-Channel, gain x1, x10, x100

Battery Powered ICP® Signal Conditioners

Model Number	480C02	480E09	480B21
Style	Basic	Gain	3 channel with gain
Channels	1 channel	1 channel	3 channels
Sensor excitation	28 VDC, 2.5 mA	28 VDC, 2.5 mA	25 to 30 VDC, 3 mA
Gain	unity	x1, x10, x100	x1, x10, x100
Low frequency response (-5%) ^[1]	0.05 Hz	0.15 Hz	0.15 Hz
High frequency response (-5%)	500k Hz	100k Hz	90k Hz
Broadband noise (at unity gain)	3.25 μ V rms	3.25 μ V rms	3.54 μ V rms
Battery (qty) type	(3) 9 V	(3) 9 V	(3) 9 V
Average battery life	100 hour	40 hour	25 to 40 hour
Input/output connectors	BNC/BNC	BNC/BNC	BNC/BNC
External DC powerable	yes	yes	yes
DC power input jack	3.5 mm	3.5 mm	mini DIN 6-pin jack
Size (height x width x depth)	4.0 x 2.9 x 1.5 in (10 x 7.4 x 3.8 cm)	4.0 x 2.9 x 1.5 in (10 x 7.4 x 3.8 cm)	7.5 x 5 x 2 in (19.1 x 12.7 x 5.1 cm)
Weight	0.62 lb (284 g)	0.75 lb (341 g)	1.1 lb (499 g)
Optional Models			
Rechargeable (supplied with Ni-cad batteries and Model 488A02 AC powered recharger unit)	R480C02	R480E09	N/A
Options			
AC powered recharger unit with (3) 9 V Ni-cad batteries	488A02	488A02	N/A
AC power supply operates from 115 or 230 VAC	488A03	488A03	488A10

Note: [1] With 1 megohm load.

Line Powered ICP® Sensor Signal Conditioners

Line powered signal conditioners offer bench-top methods for powering ICP® sensors in the laboratory and conditioning their output signals for transmittal to readout and recording instruments. Each features a color-coded input circuit checkout meter to alert of

proper sensor turn-on or input fault due to open or short-circuit connections. AC and DC powerable units can operate either with the supplied AC powered transformer or optional external battery pack. AC/DC coupled outputs offer the ability to achieve true DC frequency response in order to accurately condition very low frequency vibrations or long duration shock pulses.



Model 482A21
Unity gain, low-noise, AC and DC powerable

Model 482A22
4-channel, unity gain, low-noise, AC and DC powerable

Model 482B06
Basic, unity gain

Model 482B11
Gain x1, x10, x100

Model 484B02
Clamped output, unity gain, AC/DC coupled output

Model 484B06
Low frequency, unity gain, AC/DC coupled output

Model 484B11
Low frequency, gain x1, x10, x100, AC/DC coupled output

Line Powered ICP® Signal Conditioners

Model Number	482A21	482A22	482B06	482B11	484B02	484B06	484B11
Style	Low-noise AC and DC power	Low-noise AC and DC power	Basic	Gain	Clamped output AC/DC coupled	Low frequency AC/DC coupled	Low frequency with gain
Channels	1 channel	4 channels	1 channel	1 channel	1 channel	1 channel	1 channel
Sensor excitation ⁽¹⁾	26 volt, 2 to 20 mA	26 volt, 2 to 20 mA	24 volt, 2 to 20 mA	24 volt, 2 to 20 mA	24 volt, 2 to 20 mA	24 volt, 2 to 20 mA	24 volt, 2 to 20 mA
Gain	unity	unity	unity	x1, x10, x100	unity	unity	x1, x10, x100
Low frequency response (-5%)	<0.1 Hz ⁽²⁾	<0.1 Hz ⁽²⁾	<0.05 Hz	0.17 Hz	DC	DC	DC
High frequency response (-5%)	>1M Hz	>1M Hz	1M Hz	200k Hz	200k Hz	200k Hz	200k Hz
Broadband noise (at unity gain)	<3.25 μ V rms	<3.25 μ V rms	<3.64 μ V rms	N/A	28.8 μ V rms	28.8 μ V rms	10 μ V rms
Power required	36 VDC 120 mA ⁽³⁾	36 VDC 120 mA ⁽³⁾	115 VAC 50 to 400 Hz	115 VAC 50 to 400 Hz	115 VAC 50 to 400 Hz	115 VAC 50 to 400 Hz	115 VAC 50 to 400 Hz
Input/output connectors	BNC/BNC	BNC/BNC	BNC/BNC	BNC/BNC	BNC/BNC	BNC/BNC	BNC/BNC
External DC powerable	yes	yes	no	no	no	no	no
DC power input jack	DIN	DIN	—	—	—	—	—
Size (height x width x depth)	6.3 x 2.4 x 11 in (16 x 6 x 28 cm)	6.3 x 2.4 x 11 in (16 x 6 x 28 cm)	4.3 x 1.8 x 6 in (11 x 4.6 x 15 cm)	4.3 x 1.8 x 6 in (11 x 4.6 x 15 cm)	5 x 2 x 10.5 in (12.7 x 5.1 x 26.7 cm)	4.3 x 1.8 x 6 in (11 x 4.6 x 15 cm)	4.3 x 1.8 x 6 in (11 x 4.6 x 15 cm)
Weight	1.51 lb (685 gm)	1.67 lb (756 gm)	1.2 lb (544 gm)	2 lb (907 gm)	2 lb (907 gm)	2 lb (907 gm)	2 lb (907 gm)
Optional Models							
210 to 250 VAC powerable	standard	standard	F482B06	F482B11	F484B02	F484B06	F484B11
Options							
External 36 VDC battery pack	488B07	488B07	N/A	N/A	N/A	N/A	N/A

Note: 1. Current is factory set at 4 mA but is user adjustable between 2 and 20 mA. 2. With 1 megohm load. 3. Supplied with Model 488A04 AC power adaptor (100 to 240 VAC, 50 to 60 Hz input; 36 VDC 120 mA output)

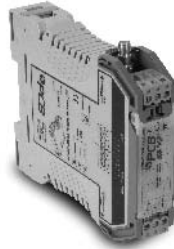
DIN Rail Signal Conditioners for ICP® Sensors

DIN rail mount signal conditioners offer a convenient mounting package for industrial applications. Signal conditioners may be mounted inside protected enclosures or in a control panel for easy access to sensor and power supply connections, and integration with machine controllers.

The signal conditioners are designed for operation with ICP® force or strain sensors and are ideally suited for monitoring forces experienced during manufacturing, assembly, on-line processes, quality assurance, or end-of-line product testing.

Model 410A01

The Model 410A01 DIN rail mount, ICP® Sensor Signal Conditioner, for piezoelectric force or strain sensors, is ideally suited for monitoring manufacturing forces experienced during assembly & product testing. With its long discharge time constant, and high frequency response, both quasi-static and dynamic measurements up to 10 kHz are possible. The unit synchronizes with machine cycles through a reset feature while analog and peak hold outputs allow for real-time monitoring with machine control devices. Requires 24 VDC power.



Model 682A02

The Model 682A02 DIN rail mount, ICP® Signal Conditioner provides 18 VDC sensor excitation voltage for dynamic measurements only. Internal jumpers select excitation current of 4 or 10 mA and voltage gain of x1, x10, or x100.



Model 682A01

24 VDC Power Supply, 120 to 230 VAC powered, DIN rail mount, 3.75 kV isolation, 1,000 mA maximum.



Model 682A06

Programmable, universal transmitter with current, voltage, and two relay outputs. Accepts mA, VDC, RTD, TC, linear resistance, and potentiometer inputs. Fully programmable via detachable display (Model 070A80 sold separately), and operates from 19.2 to 300 VDC, or 21.5 to 253 VAC power.



These products conform to applicable European Directives for CE marking.

DIN Rail Signal Conditioners for ICP® Sensors		
Model	410A01 [1]	682A02 [1]
English (SI)		
Performance		
Channels	1	1
Excitation Voltage (± 1 VDC)	18 VDC	18 VDC [2]
Excitation Current (± 1 mA)	4 mA	4/10 mA
Output Voltage (Instantaneous)	± 10 V	± 5 V
Output Voltage (Peak)	0 to 10 V	-
High Frequency Response	10 kHz	100 kHz
Low Frequency Response, AC coupled (-5 %)	0.5 Hz	1.25 Hz
Low Frequency Response, DC coupled	0 Hz [3]	DC coupling not available
Voltage Gain (Incremental Steps)	x0.5, x1, x2, x4, x8, x10, x16, x20	x1, x10, x100
Environmental		
Temperature Range (Operating)	+60 to +110 °F (+15 to +45 °C)	+32 to +158 °F (+0 to +70 °C)
Electrical		
Power Required ($\pm 10\%$)	24 VDC	
Current Draw	100 mA	60 mA
Broadband Electrical Noise (1 Hz to 10 kHz)	20 μ V rms	50 μ V rms
Peak Hold Reset	Solid State Relay	-
Discharge Time Constant (AC coupled)	1 sec	0.4 sec
Physical		
Size (Length x Height x Width)	3.6 x 4.4 x 0.9 in (91 x 112 x 23 mm)	3.1 x 4.3 x 1.0 in (79 x 84 x 25 mm)
Mounting	DIN Rail	
Electrical Connector (Sensor Input)	SMA	Screw Terminals
Electrical Connector (Analog Output, Peak Output, Power, Ground)	Screw Terminals	

Notes: [1] This product conforms to applicable European Directives for CE marking. [2] If unit is used in conjunction with a sensor having a bias over 13 VDC, full scale output may be affected. [3] In DC coupled mode, system low frequency response is determined by the sensor.

Modular-Style Signal Conditioners



CE

Modular Signal Conditioning Systems

Modular-Style Signal Conditioners

Modular signal conditioners are comprised of selected signal conditioning modules, and an AC power supply module, assembled into a 2-, 3-, 5-, or 9-slot chassis. Available modules condition ICP[®], charge output, or capacitive sensor signals. The common chassis backplane architecture permits mixing and matching of modules to achieve the desired number of channels and signal conditioning features. Visit www.pcb.com for full details of available items.

Modular-Style Signal Conditioners



Model 442B216

16-channel, unity gain, with selectable ICP[®] or voltage mode



Model 442B316

16-channel, unity gain, with selectable AC coupled ICP[®] or DC coupled voltage mode



CE

Model 442C04

4-channel, gain x1, x10, x100 for ICP[®] sensors



CE

Model 443B02

Dual mode amplifier for charge output and ICP[®] sensors with short, medium and long discharge time constants

Modular-Style Signal Conditioners

Model Number	442B216	442B316	442C04	443B02 ^[6]
Channels	16 channels	16 channels	4 channels	1 channel
Sensor excitation ^[1]	22 volt, 2 to 10 mA	22 volt, 2 to 10 mA	25.5 volt, 0.5 to 20 mA	24 volt, 0 to 20 mA ^[2]
Gain (each channel)	x1	x1	x1, x10, x100	x0.1 to 1000
Charge sensitivity	N/A	N/A	N/A	0.0001 to 10 volts/pC
Low frequency response (-5%)	0.125 Hz	0.125 Hz	0.05 Hz ^[3]	2, 0.2, 0.03, 0.003, ~0 Hz ^[4]
High frequency response (-5%)	30k Hz	30k Hz	100k Hz	0.1, 1, 3, 10, 100, >200k Hz ^[5]
Broadband noise (at unity gain)	100 μ V rms	100 μ V rms	10 μ V rms	9 μ V rms
Power required	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz	100 to 240 VAC 50 to 60 Hz
Input/output connectors	DB-50 Female/Quad Agilent E1432	DB-50 Female/Quad Agilent E1432	BNC/BNC	BNC/BNC
Size (height x width x depth)	5.05 x 3.6 in ^[7] (128.3 x 91.4 mm)	5.05 x 3.6 in ^[7] (128.3 x 91.4 mm)	6.2 x 4.25 x 10.2 in (15.7 x 10.8 x 26 cm)	6.2 x 6.05 x 10.2 in (15.7 x 15.4 x 26 cm)
Weight	0.95 lb (0.43 kg)	0.95 lb (0.43 kg)	5.1 lb (2.3 kg)	6.4 lb (2.9 kg)

Notes: [1] Current is factory set at 4 mA but is user adjustable up to 20 mA. [2] Excitation is disabled for charge output sensor input. [3] With 1 megohm load. [4] Adjusted by discharge time constant and high-pass filter selection. [5] Adjusted by low-pass filter selection. [6] Charge input range for Model 443B02 is limited to 100k pC. For high sensitivity charge output force sensors, use appropriate Series 472B charge attenuator to achieve desired full-scale force range where necessary. See page 1.68. [7] Conforms to Series 440 Modular System.

Multi-Channel Signal Conditioners

Multi-channel rack mount signal conditioners contain 8- or 16-channels of simultaneous signal conditioning and can be configured for multiple unit, daisy-linking with computerized set up and control. The building block-style architecture permits factory configuration to include characteristics which best tailor a unit for the specific application and data acquisition requirements. Standard features include ICP® sensor excitation and LED indicators for input fault monitoring and overload detection. Optional features include

programmable gain, autoranging, filtering, output switching, integration, IEEE-488, RS-232, and RS-485 interface, and keypad control with LCD display. Units are available to condition signals from ICP® and charge output sensors, or can be set up to accept voltage input signals from other types of sensors. Pre-configured models offer ease of ordering units possessing the most commonly requested features. Visit www.pcb.com for full details of available items.

Modular-Style Signal Conditioners



Model 481A01
16-channel, unity gain
for ICP® sensors

Model 481A20
16-channel, unity gain
for ICP® sensors

CE



CE

Model 481A02
16-channel, gain x1,
x10, x100 for ICP®
sensors

Model 481A03
16-channel, continuous
gain x0.1 to x200
for ICP® sensors

All Models available in 8- or 16-channel custom configurations

All Models available in 8- or 16-channel custom configurations

Multi-Channel Signal Conditioners				
Model Number	481A01	481A02	481A03	481A20
Style	unity gain	selectable gain with keypad & display	continuous gain adjust with keypad & display	unity gain
Channels	8 or 16	8 or 16	8 or 16	8 or 16
Sensor excitation ^[1]	24 volt, 3 to 20 mA	24 volt, 3 to 20 mA	24 volt, 3 to 20 mA	24 volt, 3 to 20 mA
Gain (each channel)	unity	autoranging x1, x10, x100	continuous x0.1 to x200	unity
Frequency response (± 5%)	0.5 to 100k Hz	0.5 to 100k Hz	0.5 to 90k Hz ^[2]	0.05 to 1M Hz
Broadband noise (at unity gain)	11 µV rms	11 µV rms	4 mV	11 µV rms
Power required	100 to 240 VAC 47 to 63 Hz	100 to 240 VAC 47 to 63 Hz	100 to 240 VAC 47 to 63 Hz	100 to 240 VAC 47 to 63 Hz
Keypad control	no	yes	yes	no
Computer control	no	RS-232 and RS-485 ^[3]	RS-232 and RS-485 ^[3]	no
Input connectors	DB50 and BNC	DB50 and BNC	DB50 and BNC	BNC
Output connectors	DB37 and BNC	DB37 and BNC	DB37 and BNC	BNC
Size (height x width x depth)	3.5 x 19.0 x 16.25 in (9 x 48 x 41 cm)	3.5 x 19.0 x 16.25 in (9 x 48 x 41 cm)	3.5 x 19.0 x 16.25 in (9 x 48 x 41 cm)	3.5 x 19.0 x 16.25 in (9 x 48 x 41 cm)
Weight	15 lb (6.8 kg)	15 lb (6.8 kg)	15 lb (6.8 kg)	15 lb (6.8 kg)

Note: [1] Current is factory set at 4 mA but is user adjustable between 3 and 20 mA. [2] Attains 90k Hz with filter disabled. [3] Supplied with Windows® based control software program.



Series 422E

Contact factory for custom ranges and information regarding Series 422M.

NOTE: [1] High frequency achieved at 20 mA excitation



Series 402

Note: [1] High frequency achieved at 20 mA excitation

Charge Converters

Series 422E charge converters serve to convert charge output sensor signals to low-impedance voltage signals, for transmission over long cables, and interface to data acquisition equipment. They are low in noise, powered by standard ICP® sensor signal conditioners, and install in-line between the sensor and signal conditioner. Charge converters with signal conditioners offer a less expensive technique, compared to the use of laboratory-style charge amplifiers, and are an especially attractive approach for multi-channel requirements. Like charge amplifiers, charge converters also invert the polarity of the measurement signal.

Inverting Charge Converters for Use with Charge Output Sensors

Charge Converter Models	422E11	422E12	422E13
Gain	100 mV/pC ± 5%	10 mV/pC ± 2%	1 mV/pC ± 2%
Input range ± 2%	± 25 pC	± 250 pC	± 2500 pC
Output voltage range	± 3 volts	± 3 volts	± 3 volts
Frequency response (± 5%) ^[1]	5 to 110k Hz	5 to 100k Hz	5 to 100k Hz
Broadband noise	60 µV rms	20 µV rms	11 µV rms
Power required	18 to 28 VDC	18 to 28 VDC	18 to 28 VDC
Constant current required	2.2 to 20 mA	2.2 to 20 mA	2.2 to 20 mA
Input connector	10-32 jack	10-32 jack	10-32 jack
Output connector	BNC jack	BNC jack	BNC jack
Size (length x diameter)	3.4 x 0.5 in (8.6 x 1.3 cm)	3.4 x 0.5 in (8.6 x 1.3 cm)	3.4 x 0.5 in (8.6 x 1.3 cm)
Weight	1.1 oz (31g)	1.1 oz (31g)	1.1 oz (31g)
Optional Models			
0.5 Hz (-5%) low frequency	422E01	422E02	422E03

Impedance Converters and In-Line Voltage Follower Amplifiers

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.

Non-Inverting Voltage Follower Amplifiers and Impedance Converters for Use with Charge Output Sensors

Voltage Follower Models	402A	402A02	402A03
Voltage gain (± 2%)	0.98	0.98	0.98
Output Range	± 10 V	± 10 V	± 10 V
Input Capacitance	< 8.0 pF	100 ± 10% pF	1000 ± 10% pF
Discharge time constant	1.0 second	10 second	100 second
Frequency response (± 5%) ^[1]	0.5 to 1M Hz	0.05 to 1M Hz	0.005 to 1M Hz
Broadband noise	43 µV rms	43 µV rms	43 µV rms
Output bias	9 to 13 V	9 to 13 V	9 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 (28 x 6 mm)	1.17 x 0.25 in (28 x 6 mm)	1.17 x 0.25 in (28 x 6 mm)



Model 421A13



Model 421A11

Series 421A industrial charge amplifiers are designed for piezoelectric charge output force or strain sensors, and are ideally suited for monitoring manufacturing forces experienced during assembly, crimping, injection molding, stamping or product testing. With their long discharge time constant and high frequency response, both quasi-static and dynamic measurements are possible. Each model synchronizes with machine cycles through a reset feature while analog, peak or alarm outputs allow for real-time monitoring.

The single channel Model 421A11 and 3-channel Model 421A13 are packaged in a rugged, surface mount, CE marked, sealed aluminum enclosure and are ideal for fixed installations in a factory environment. Set up via internal adjustments prohibits tampering once it is sealed and deployed. Additional features include electrical ground isolation, high vibration resistance, and a cord grip for securing the supplied, 10 ft (3 m) interfacing cable. The 3-channel Model 421A13 is a cost-effective configuration that supports use with charge output, 3-component force sensors and force links.

Industrial Charge Amplifiers, Analog Output Only

Model	421A11	421A13
Channels	1	3
Input Ranges (selectable for each channel)	± 100 to 1000 pC (Range I) ± 1000 to 10k pC (Range II) ± 10k to 100k pC (Range III)	
Sensitivity	5 mV/pC (Range I) 0.50 mV/pC (Range II) 0.05 mV/pC (Range III)	
Maximum Output	5 VAC	
Frequency range (-5%)	~ 0 to 4000 Hz (Range I) ~ 0 to 10k Hz (Range II) ~ 0 to 12k Hz (Range III)	
Broadband noise [1]	11 µV	
Temperature Range (Operating)	+23 to +140 °F (-5 to +60 °C)	
Power required	15 to 30 VDC, < 19 mA	15 to 30 VDC, < 37 mA
Input connector [2]	BNC jack	
Output connector [3]	Screw Terminal	
Size	4.89 x 1.18 x 2.52 in (124.2 x 30 x 64 mm)	6.95 x 1.18 x 2.52 in (176.5 x 30 x 64 mm)
Weight [4]	0.915 lb (415.04 gm)	1.320 lb (598.7 gm)

Notes: [1] Noise measurements performed at 10k-100k pC range. [2] Optional TNC jack on input, order as Model 421A11/A or 421A13/A. Optional 10-32 (micro) connector on input, order as Model 421A11/B or 421A13/B. [3] Supplied with 10 ft (3 m) multi-conductor cable & PG-9 cord grip. [4] Including multi-conductor cable.

Industrial Charge Amplifiers



Model 421A25

Model 421A25 features 13 fixed input ranges, 3 additional ranges with continuous gain adjustment, analog and peak hold outputs, and 2 adjustable set points that trigger digital alarm outputs when levels are exceeded. An integral test function enables a check of the measuring chain without a sensor being connected. All adjustments are set by either remote control or RS-232 interface, and the settings are maintained when the power is disconnected. The RS-232 may also be used to transfer measurement data. The unit is packaged in a rugged, CE marked aluminum enclosure, well suited for harsh industrial environments.

Industrial Charge Amplifier, Analog, Peak and Alarm Outputs	
Model	421A25
Channels	1
Input Range (adjustable)	± 100 to $\pm 1,000,000$ pC
Output Voltage (Instantaneous)	± 10 V
Output Voltage (Peak)	0 to 10 V
Frequency Response (-3 dB) (" 100k pC)	-0 to 20 kHz
Frequency Response (-3 dB) (< 100k pC)	-0 to >2 kHz
Accuracy	$<\pm 1\%$ FS
Non-Linearity	$<0.02\%$ FS
Control Input	± 5 to 45 V
Alarm Output	45 V, 100mA
Temperature Range (Operating)	+23 to +140 °F (-5 to +60 °C)
Power Required	15 to 35 VDC
Current Draw	<70 mA
Broadband Electrical Noise	<20 mV pp
Output Resistance	10 ohm
Drift	<0.03 pC/s
DC Offset (max)	± 10 mV
Size (l x w x h) – Overall	3.9 x 3.1 x 1.3 in (98 x 79 x 34 mm)
Enclosure Material	Aluminum
Electrical Connector (input)	BNC Jack
Electrical Connector (output, setup, control, power)	25-Pin D-Sub
Options	
Input/Output Connector, 25 pin D-Sub	JC
Input/Output Cable, 25 pin D-Sub to pigtails, 5ft. (1.5m) length	009M146

Note: This product conforms to applicable European Directives for CE marking.



Series 472B

Model	Divided by
472B01	10
472B02	15
472B03	50
472B04	100

Series 472B Charge Attenuators

Series 472B charge attenuators are used in conjunction with high-sensitivity charge output force sensors when their full-scale output range exceeds the charge input limit of the charge amplifier or converter with which it is used. Series 472B charge attenuators serve to divide the output signal delivered by the force sensor by the factor indicated in the table at left.



Model 492B

ICP® Sensor Simulator

Model 492B ICP® sensor simulator installs in place of an ICP® sensor and serves to verify signal conditioning settings, cable integrity, and tune long lines for optimum system performance. By use of an internal oscillator, the unit delivers a 100 Hz sine or square wave at a selectable peak to peak voltage. External test signals from a function generator may also be inserted. This portable unit is battery powered.

Model 401A04 ICP® sensor simulator installs in place of an ICP® sensor and accepts test signals from a voltage function generator. The unit serves to verify signal conditioning settings, cable integrity, and tune long lines for optimum system performance. This unit requires power from an ICP® sensor signal conditioner.



Model 401A04

Step Function Generator

Model 492B03 generates a rapid charge or voltage step function from zero to a selected peak value between either 0 and 100k pC or 0 and 10 volts DC. The unit is useful for setting trigger points in recording equipment and verifying charge amplifier and data acquisition equipment setup. This unit is battery powered and portable.



Model 492B03

DC Power Conditioner

Model 485B serves to regulate available current from any conventional DC power supply or battery source to a constant value between 2 and 20 mA as required by ICP® sensors. In addition, the unit decouples the sensor's output bias voltage from the measurement signal to enable zero-based measurements with any readout device.



Model 485B

Summing Block for Charge Output Sensors

Model 070A15 Summing Block allows the addition of up to four charge inputs and sums them to provide one charge output. It is typically used to sum multiple force sensor inputs to allow use of a single channel charge amplifier.

- Connectors: (4) 10-32 jack inputs
- (1) BNC jack output



Model 070A15



PCB's in-house machining capabilities allow full control of the production of precision parts to insure quality and timely delivery. Capabilities including dual spindle CNC lathes, wire EDM machines, and injection molding machines fabricate in excess of 200,000 parts per month to exacting standards.