



# Simple Weld Force Monitoring

## Highlights

- Controls Electrode Clamping Force
- Triggers Weld Current to Cut Cycle Time
- Avoids Damage and Detects Wear of Electrode Tips
- Monitors and Documents Process Deviations
- Helps Ensure Weld Quality and Zero Defects



**Series M240 Strain Sensors Monitor and Control Weld Forces to Ensure Quality End Products**

### Do your customers demand zero defects?

Simple monitoring systems, consisting of piezoelectric quartz ICP® strain sensors, connecting cables, and signal conditioners are ideal for industrial process control and product quality assurance applications that require the measurement of repetitive cycles. ICP® strain sensors feature high stiffness, sensitivity stability, repeatability, high resolution, extremely long lifetime, and robust packaging for harsh industrial environments.

Weld quality is directly affected by electrode clamping force. ICP® strain sensors may be used to verify that the clamping force has reached a desired minimum value before applying weld current. After reaching the minimum value, the strain signal is used to immediately trigger weld current, which cuts cycle time and avoids electrode damage due to premature activation.

The strain signal may also be used to control the desired force value throughout the weld cycle. Strain data is logged to trend electrode tip wear, capture process deviations, and document the process to help ensure delivery of high quality parts with zero defects.

As with all PCB® instrumentation, this equipment is complemented with toll-free applications assistance, 24-hour customer service, and is backed by a no-risk policy that guarantees satisfaction or your money refunded.



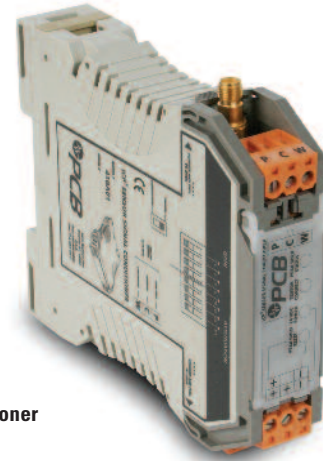
**Series M240 ICP® Strain Sensors**



# Weld Force Monitoring System



Series M240 ICP® Strain Sensors



Model 410B01  
ICP® Sensor Signal Conditioner

ICP® Strain Sensors			
Model	M240A01	M240A02	M240A03
<b>Performance</b>			
Sensitivity (± 20%)	10 mV/με	50 mV/με	100 mV/με
Measurement Range	300 pk με	100 pk με	50 pk με
Low Frequency Range (-5%)	0.004 Hz	0.004 Hz	0.004 Hz
Broadband Resolution (1 to 10,000 Hz)	0.001 με	0.0002 με	0.0001 με
<b>Environmental</b>			
Temperature Range (Operating)	-65 to +250 °F (-54 to +121 °C)		
<b>Electrical</b>			
Output Bias Voltage	8 to 14 VDC		
Discharge Time Constant	≥ 150 sec		
<b>Mechanical</b>			
Sensing Element	Quartz		
Housing Material	Stainless Steel		
Electrical Connector	10-32 Coaxial Jack		
Sealing	Epoxy		
Mounting Torque	7.38 ft-lb (10 N-m)		
Size (Width x Length x Height)	0.67 x 1.81 x 0.6 in 17 x 46 x 15.2 mm		
<b>Supplied Accessories</b>			
Model M081A100 M6 x 1.00 flathead screw			
<b>Optional Versions (specify with prefix letter shown)</b>			
J - Ground Isolated			

ICP® Sensor Signal Conditioner	
Model	410B01
<b>Performance</b>	
Channels	1
Output Voltage (Instantaneous)	+/- 10 V
Output Voltage (Peak)	0 to 10 V
High Frequency Response	10 kHz
Low Frequency Response, AC coupled (-5%)	0.5 Hz
Low Frequency Response, DC coupled	0 Hz
Voltage Gain (Incremental Steps)	x0.5, x1, x2, x4, x8, x10, x16, x20
<b>Environmental</b>	
Temperature Range (Operating)	-60 to +110 °F (+15 to +45 °C)
<b>Electrical</b>	
Power Required (± 10%)	24 VDC
Current Draw	100 mA
Broadband Electrical Noise (1 Hz to 10 kHz)	20 μV rms
Peak Hold Reset	Solid State Relay
Discharge Time Constant (AC coupled)	1 sec
<b>Mechanical</b>	
Size (Width x Length x Height) in (mm)	3.58 x 4.41 x 0.91 91 x 112 x 23
<b>Mounting</b>	
<b>DIN Rail</b>	
Electrical Connector (Sensor Input)	SMA
<b>Electrical Connection</b>	
(Analog Output, Peak Output, Power, Ground)	Removable Screw terminals



3425 Walden Avenue, Depew, NY 14043-2495 USA

Toll-Free in USA 800-828-8840

24-hour SensorLine<sup>SM</sup> 716-684-0001

Fax 716-684-0987 E-mail info@pcb.com

Web Site www.pcb.com

AS9100 CERTIFIED ■ ISO 9001 CERTIFIED ■ A2LA ACCREDITED to ISO 17025

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