



## ProAccel® Triaxial Accelerometer Bi-Polar Version

### Owner's Manual



#### 1. Introduction

Watson Industries has been designing and manufacturing solid-state sensors since 1980. They have now produced a new series of accelerometers, the ProAccel®. Based on proven technology, this accelerometer is built under AS9100 quality standards with many new features.

#### 2. Description

The best description of the ProAccel® triaxial accelerometer is ACCURACY. Scale factor, bias and alignment have all been optimized far beyond the performance of the usual MEMS accelerometer. There is no better triaxial accelerometer for instrumentation, stabilization and control applications.

The Pro Accel® scale factor, bias and alignment have all been optimized far beyond the performance of the usual MEMS accelerometer. Features that are standard for the Pro Accel® include available rate ranges up to 10g's, internal power regulation for power input between 8 volts and 45 volts, EMI and RFI protection, and a case mounted connector.

### 3. Characteristics

#### 3.1 Electrical

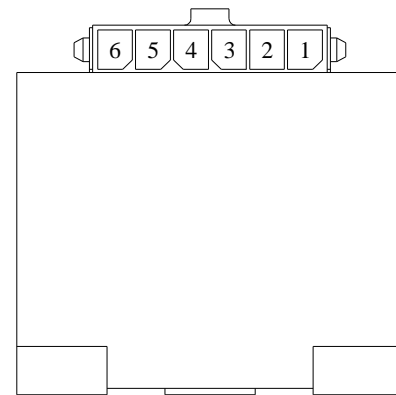
The input range, sensitivity, and resolution for different bipolar versions of the ProAccel® are given in Table 1.

**Table 1**

Part Number	Range	Nominal Scale Factor		Voltage Range for Full Scale Rate*
		V/g	g/V	
ACC-322-3A	±2 g's	2.50	0.40	±5 V
ACC-332-3A	±5 g's	1.00	1.00	±5 V
ACC-342-3A	±10 g's	0.50	2.00	±5 V

#### Connector Pin-outs:

Pin	Description
1	Z Accelerometer Output
2	Signal Ground (Connected internally to Pin 5)
3	Y Accelerometer Output
4	X Accelerometer Output
5	Power Ground
6	+8 to +45V Supply



#### Optional Wire Bundle (Flying Leads):

To order a ProAccel® with optional wire bundle, add a 'W' to the end of the part number. For example: ACC-332-3AW.



Wire Color	Wire size	Description
Red	24 awg extruded TFE	+8 to +45V Supply
Black	24 awg extruded TFE	Power Ground
Blue	24 awg extruded TFE	X Accelerometer Output
Orange	24 awg extruded TFE	Y Accelerometer Output
Green	24 awg extruded TFE	Signal Ground (Connected internally to Power Ground)
Yellow	24 awg extruded TFE	Z Accelerometer Output

**Figure 1: Electrical Interface**

### 3.2 ProAccel® Specifications

#### Acceleration

Range:	±5 g's (typical)	See table on front page
Analog Scale Factor:	1V/g (Typical)	See table on front page
Scale Factor Accuracy:	0.2%	At constant room temperature
Scale Factor Temp Coefficient:	0.5%	Over temperature range
Bias: At room temp	5mg	
Bias: Zero Bias	<10mg	Run-To-Run variation
Bias: Over Temp Range	<10mg	
Non-Linearity:	< 0.1%	Full scale range
Bandwidth:	100 Hz	Butterworth
Noise:	1.5mg rms	1 Hz to 100 Hz

#### Environmental

Temperature: Operating	-40°C to +85°C	
Temperature: Storage	-55°C to +85°C	
Vibration: Operating	5g rms	20Hz to 2kHz
Vibration: Survival	10g rms	20Hz to 2kHz
Shock: Survival	500g	10ms ½ sine wave

#### Electrical

Input Power:	8 to 45 VDC	Reverse Protected
Input Current:	20mA at 12V	0.25W
Analog Output	±5VDC	
Output Impedance:	1000 Ohm	5%

#### Physical

Size: Including Mounting Flanges	1.2"W x 2.8"L x 1.2"H	30 x 71 x 30 (mm)
Weight:	2.0 oz	57g
Connection:	Amp 1445057-6 Connector (6 pin)	Mating Connector Incl. Wire bundle optional
Life:	> 100,000 Hours MTBF	20 years shelf life

- Specifications are subject to change without notice.
- This product may be subject to export restrictions. Please consult the factory.

### 3.3 Mating Connector

The ProAccel® mating connector is made by Amp-Tyco Electronics. One mating connector is included with each sensor. Each connector consists of two parts: the connector receptacle and the receptacle contacts (Qty 6). Additional connectors may be purchased from Amp-Tyco Electronics or electronics vendors such as Digikey and Mouser.

Connector Receptacle Housing:		26-30 AWG Contacts (Qty 6):	
Vendor	Part Number	Vendor	Part Number
AMP-Tyco	1445022-6	AMP-Tyco	1794611-1
Digikey	A30262-ND	Digikey	A33279-ND
Mouser	571-14450226	Mouser	571-7946111

### 3.4 Mounting

The physical dimensions of the unit are shown in Figure 2. A three-point mounting is provided on the case of the unit. The accelerometer is to be attached by three # 4 screws (or 3 mm) through the 0.120" holes in the mounting feet. To avoid distortion, the accelerometer must be attached to a clean, flat surface, and the fasteners must be tightened evenly.

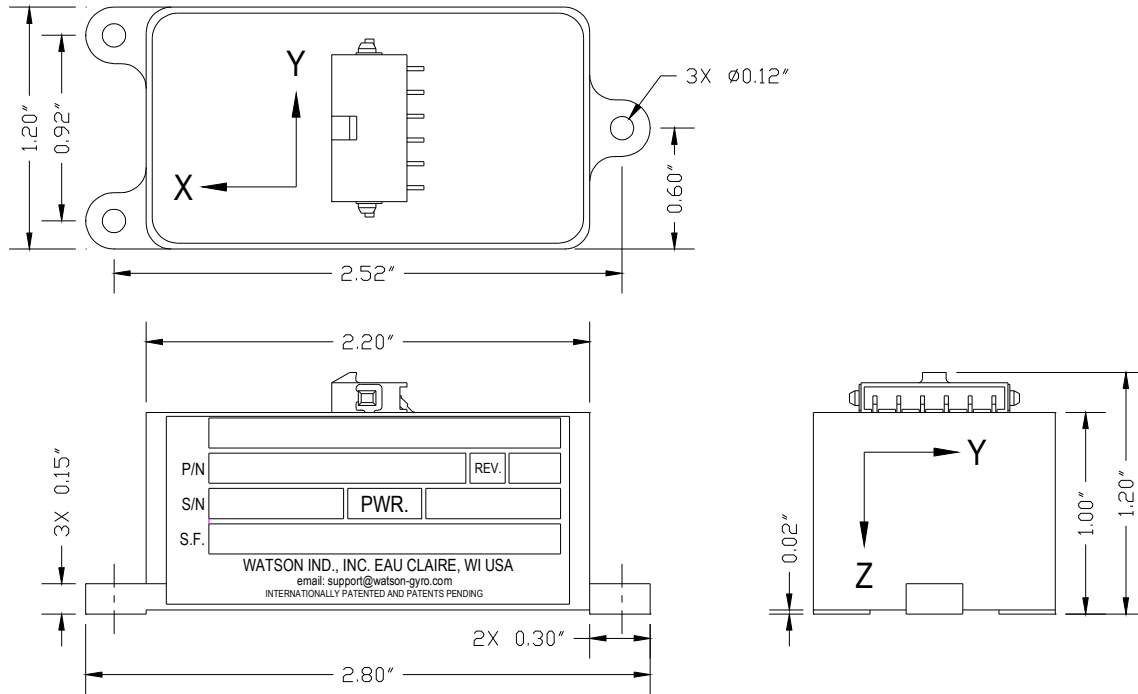


Figure 2: Dimensions

## 4. Constraints

The case of the ProAccel® is splash resistant, but not hermetically sealed. Avoid prolonged exposure to moisture.

The power ground is already connected internally to the signal ground. Do not connect the ground wires externally.

***The ProAccel® although of rugged design, is a sensitive instrument. Take care when handling it.***

## **Warning**

Rough handling, dropping, or miswiring this unit is likely to cause damage.

### **DISCLAIMER**

The information contained in this manual is believed to be accurate and reliable; however, it is the user's responsibility to test and to determine whether a Watson Industries' product is suitable for a particular use.

Suggestion of uses should not be taken as inducements to infringe upon any patents.

### **WARRANTY**

Watson Industries, Inc. warrants, to the original purchaser, this product to be free from defective material or workmanship for a period of two full years from the date of purchase. Watson Industries' liability under this warranty is limited to repairing or replacing, at Watson Industries' sole discretion, the defective product when returned to the factory, shipping charges prepaid, within two full years from the date of purchase. The warranty described in this paragraph shall be in lieu of any other warranty, express or implied, including but not limited to any implied warranty of merchantability or fitness for a particular purpose.

Excluded from any warranty given by Watson Industries are products that have been subject to abuse, misuse, damage or accident; that have been connected, installed or adjusted contrary to the instructions furnished by seller; or that have been repaired by persons not authorized by Watson Industries.

Watson Industries reserves the right to discontinue models, to change specifications, price or design of this product at any time without notice and without incurring any obligation whatsoever.

The purchaser agrees to assume all liabilities for any damages and/or bodily injury which may result from the use, or misuse, of this product by the purchaser, his employees or agents. The purchaser further agrees that seller shall not be liable in any way for consequential damages resulting from the use of this product.

No agent or representative of Watson Industries is authorized to assume, and Watson Industries will not be bound by any other obligation or representation made in connection with the sale and/or purchase of this product.

### **PRODUCT LIFE**

The maximum expected life of this product is 20 years from the date of purchase. Watson Industries, Inc. recommends the replacement of any product that has exceeded the product life expectation.

## SERVICE

Watson Industries, Inc. has no service outlets. All service is performed at the factory. In order to insure prompt service, prior to returning units for repair please call, write or fax:

Watson Industries, Inc.  
3041 Melby Road  
Eau Claire, WI 54703  
ATTN: Service Department  
Telephone: +1 715 839-0628  
Fax: +1 715 839-8248  
Email: [support@watson-gyro.com](mailto:support@watson-gyro.com)  
Internet: [www.watson-gyro.com](http://www.watson-gyro.com)

All sensors returned under warranty will be repaired (or replaced at the sole option of Watson Industries) at no cost to the customer other than shipping charge from customer to Watson Industries (plus any export and transportation charges outside the United States).

In the case of units not under warranty, a flat repair fee will be charged. This fee can be determined by contacting Watson Industries. Modified units or those subjected to extreme abuse may be returned to the customer unrepaired.