ProAccel®

Triaxial Accelerometer ACC-322 Series
Owner's Manual

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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 ISO 9001:2015 quality standards with many new features.

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 ProAccel® scale factor, bias and alignment have all been optimized far beyond the performance of the usual MEMS accelerometer. Features that are standard for the ProAccel® include available 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.

Characteristics

Electrical

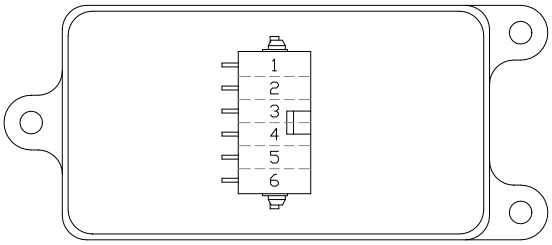
The input range, sensitivity, and resolution for different versions of the ACC-322 series ProAccel® are given in Table 1.

Table 1

Part Number	Range	Nominal Scale Factor		Voltage + 2 g Output	Voltage - 2 g Output	Voltage Zero g
		V/g	g/V			
ACC-322-3A(W)	±2 g's	2.50	0.40	+5.00 V	-5.00 V	0.00 V
ACC-322-2A(W)	±2 g's	1.25	0.80	+5.00 V	0.00 V	+2.50 V

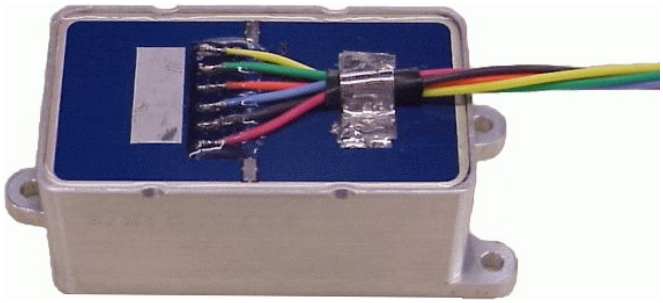
Standard configuration with case mounted connector Pin-outs:

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 configuration with wire bundle (Flying Leads):

To order a ProAccel® with optional 12" wire bundle, add a 'W' to the end of the part number. For example: ACC-322-3AW.



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

ProAccel® Specifications

Acceleration

Range: X, Y, Z	±2g	
Analog Scale Factor:	2.5 V/g (ACC-322-3A)	1.25 V/g (ACC-322-2A)
Scale Factor Accuracy:	0.2%	At constant room temp
Scale Factor Temp Coefficient:	0.5%	Over temp range
Bias: X, Y, Z	< 6mg	At room temperature
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	20 Hz to 2 KHz
Vibration: Survival	10g rms	20 Hz to 2 KHz
Shock: Survival	500g	10mS ½ sine wave

Electrical

Input Power:	8 to 45VDC	Reverse protected
Input Current:	20mA @ 12VDC	0.25W
Analog Output:	±5VDC (ACC-322-3A)	0 to 5VDC (ACC-322-2A)
Analog Output Impedance:	1000 Ohm	5%

Physical

Size: Including Mounting Flanges	1.2"W x 2.8"L x 1.2"H	3 x 7.1 x 3 (cm)
Weight:	2.0oz (0.1lb)	60 grams (0.1Kg)
Connection:	Amp 1445057-6 Connector (6 pin)	Mating Connector Incl. 12" Wire bundle optional
Life:	> 100,000 Hrs MTBF	20 years shelf life

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

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:

Vendor	Part Number
AMP-Tyco	1445022-6
Digikey	A30262-ND
Mouser	571-14450226

26-30 AWG Contacts (Qty 6):

Vendor	Part Number
AMP-Tyco	1-794611-2
Digikey	A33279-ND
Mouser	571-1-794611-2

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.

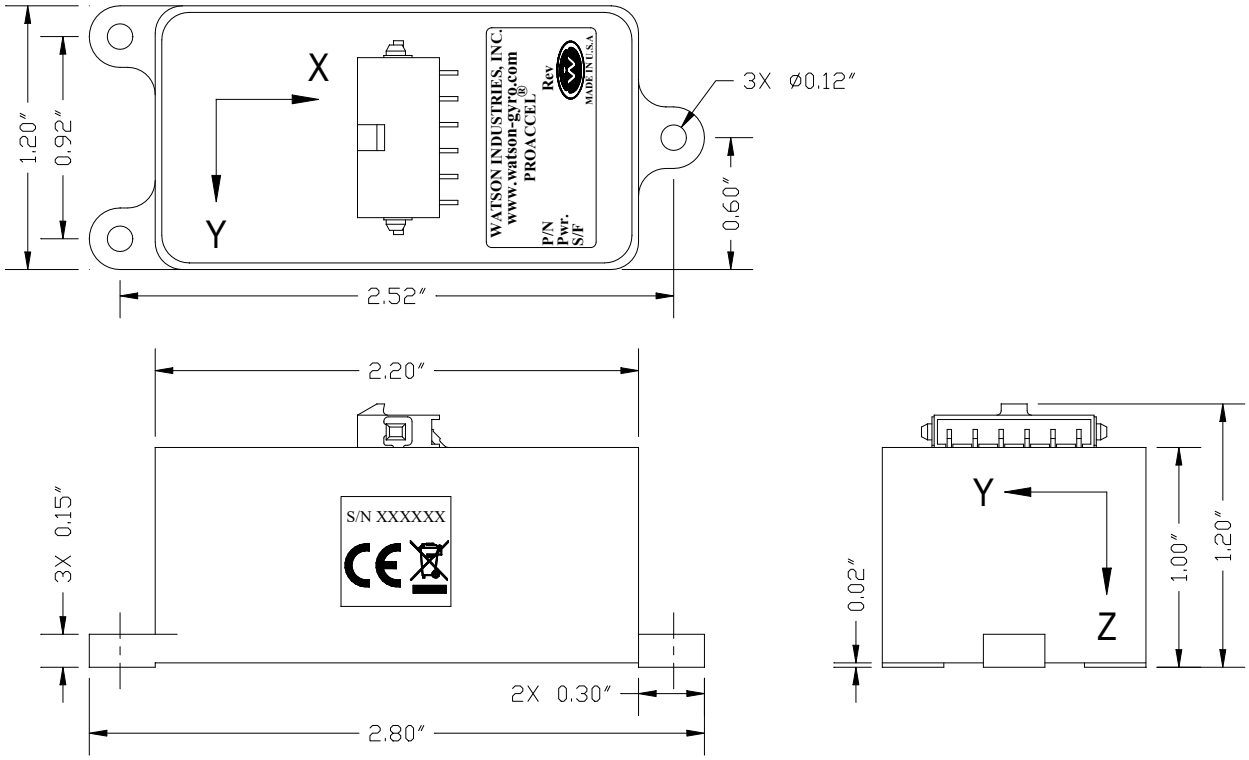


Figure 2: Dimensions

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 or dropping of this unit is likely to cause damage.
Over-voltage and/or miswiring of this unit will cause damage.
This unit should be protected against prolonged exposure to high humidity and/or salt air environments.

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 that 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.

Customer Service

All repairs, calibrations and upgrades are performed at the factory. Before returning any product, please contact Watson Industries to obtain a Returned Material Authorization number (RMA).

Return Address & Contact Information

Watson Industries, Inc.
3035 Melby Street
Eau Claire, WI 54703
ATTN: Service Department
Telephone: (715) 839-0628 Fax: (715) 839-8248 email: support@watson-gyro.com

Returning the Product

Product shall be packaged making sure there is adequate packing around all sides. Correspondence shall include:

- Customer's Name and Address
- Contact Information
- Equipment Model Number
- Equipment Serial Number
- Description of Fault

It is the customer's responsibility to pay all shipping charges from customer to Watson Industries, including import and transportation charges.

Safety Information

Watson Industries

EC Declaration of Conformity

Manufacturer
Watson Industries, Inc.
3035 Melby St.
Eau Claire, Wisconsin 54703 USA

Plant
Watson Industries, Inc.
3035 Melby St.
Eau Claire, Wisconsin 54703 USA

CE

Hereby declare that:

Product Description: Three Axis Accelerometer
Product Name: ACC-322-3A
ACC-332-3A
ACC-342-3A
Model Number: ACC

are in conformity with the provisions of the directives applied: Electromagnetic Compatibility Directive 2004/108/EC

Harmonized Standards applied:
EMC: EN 55011:2009/A1:2010 Group 1 Class B
EN 61326-1:2006

Issued By: Watson Industries, Inc.

Signature: _____

William S. Watson
President

Waste Electrical and Electronic Equipment Directive

This symbol on the product or its packaging indicates that the product must not be disposed of with normal household waste. Instead, it is your responsibility to dispose of your waste equipment by arranging to return it to a designated collection point for the recycling of waste electrical and electronic equipment. By separating and recycling your waste equipment at the time of disposal you will help conserve natural resources and ensure that the equipment is recycled in a manner that protects human health and the environment. For more information, contact Watson Industries, Inc. or visit www.watson-gyro.com