

the product line

IMPACT DETECTORS

- **Shockwatch Label** - The inexpensive way to monitor impact sensitive shipments
- **Shockwatch Clip** - Monitors impact sensitive products with ease
- **Shockwatch MAG2000** - A resettable impact monitor for large, palletized or container-sized shipments



TILT INDICATORS

- **Tiltwatch and Tiltwatch Plus** - The inexpensive way to monitor shipments that must remain upright



TEMPERATURE AND HUMIDITY INDICATORS

- **Temperature Indicator Line** - A complete line of inexpensive temperature monitoring labels for heat and cold sensitive products
- **Humidity Indicator Cards** - A complete line of low-cost indicators for various types of barrier packaging needs



what is it?

MAG2000

WHAT IS A SHOCKWATCH MAG2000? THE SHOCKWATCH MAG2000 IS AN IMPACT DETECTION DEVICE THAT WILL ACTIVATE WHEN AN IMPACT EXCEEDS THE THRESHOLD OF THE UNIT. AS AN EXTENSION OF THE SHOCKWATCH LABEL PRODUCT, THE MAG2000 IS DESIGNED TO MONITOR HANDLING CONDITIONS ON LARGE SHIPMENTS (OVER 300 POUNDS), INTERMODAL CONTAINERS, AND FREIGHT VEHICLES. THE MAIN DIFFERENCE BETWEEN THE MAG2000 AND SHOCKWATCH LABEL IS THIS UNIT IS RESETTABLE USING A SPECIALLY DESIGNED KEY. THIS MAKES THE MAG2000 COST EFFECTIVE IN A CLOSED LOOP SYSTEM.



What Can MAG2000 Do For My Customers?

- Pinpoint the source of mishandling
- Reduce in-house and in-transit damage losses
- Reduce repair and replacement costs
- Educate consignees on acceptable carrier handling
- Evaluate packaging techniques

How Is the MAG2000 Made?

A Shockwatch MAG 2000 consists of 2 magnets, one moveable and one immovable. When the moveable magnet is knocked from its home base, it will appear in a new visible position. By the position of the upper magnet you can not only determine the G level that was exceeded, but the direction of impact.

How Do You Control the Activation/Sensitivity of a Unit?

Each MAG unit is factory set, so you must order the specific G level and mounting orientation needed for your application. Each MAG2000 product has a nominal value that, when exceeded, will activate the unit.

Specifications

Minimum Order Quantity	12 units, can be mixed sensitivities
Footprint:	2.5" x 2.3" x .10" (6.35cm x 5.84cm x .254cm)
Shock Range:	1/2 to 25 G's, in 1/2 G increments
Shock Resistance:	200 G @ 11 milliseconds
Frequency:	0 to 20 Hz. flat (see activation vs. duration data)
Security:	Tamper resistant, resettable using unique key
Case Materials:	High impact ABS and acrylic
Visibility:	Highly visible, easy to read
Temperature Range:	-40°F to +150°F. (Optional -60°F to 200°F) -40°C to +65.6°C. (Optional -51.1°C to 93.3°C)
Humidity:	0% to 100%, non-condensing
Resistance:	Weatherproof and chemically resistant to solvents, acids, and petrochemicals

NOTES:

MAG2000

MAG 2000 selection guide

HOW TO SELECT THE RIGHT SENSITIVITY:

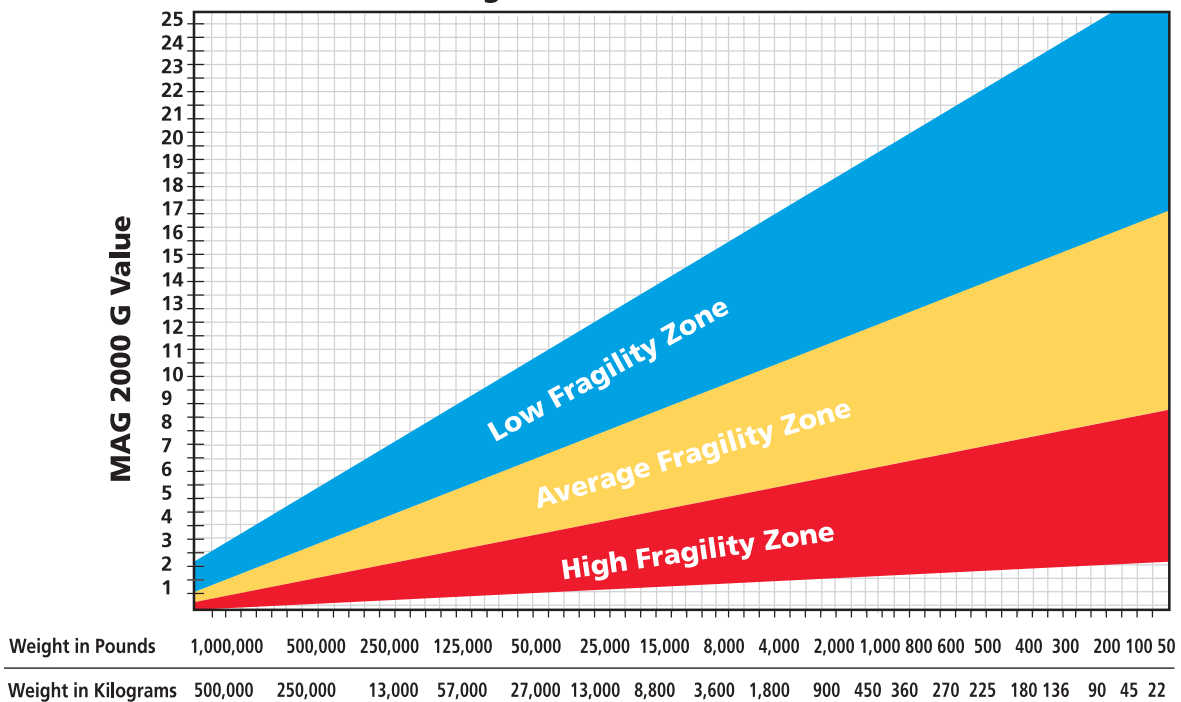
The first question to ask is if your customer has a non operating G force vs time specification . If you have this information simply select a MAG 2000 G level that matches that spec. If a specification is not available a Shockwatch/MAG 2000 slide rule has been included in this guide to aid you in the quick selection of our products, however, if you are missing yours, use the following graph in selecting a G sensitivity for your application:

For non-railcar applications there are only two things you need to know to select a MAG2000:

- 1) Know the weight of your shipment
- 2) Determine its fragility: rugged, average, or fragile

Once you have these two facts, match the weight on the x axis and match it with the fragility zone the product falls into, then match to the y axis to determine the MAG 2000 G level to order. For example, a four-thousand-pound crate that is very fragile will need a range from 1-4 G MAG device.

Mag Sensor Selection Guide



RATING FRAGILITY LEVELS - How do you know what product falls into which zone? Follow this set of rules each zone.

Low Fragility Zone - Typically requires visible and physical damage to the product to render the product inoperable. Damage can be either internal or external. Usually only extreme mishandling will cause damage to the product. The product can be shipped via any mode of transportation.

Average Fragility Zone - The majority of products fall into this category. There is a moderate degree of stability and survivability built into the product. Usually can be shipped via standard modes of transportation, such as spring-ride van, standard cushion railcars, or standard draft railcars.

High Fragility Zone - Invisible damage is the key term. Typically these products will be constructed of low tolerance components such as data storage drives, optical lenses, or any other component that require precise alignment. Pertains to most products that require specialized modes of transportation such as air-ride van or extended travel hydro-cushion railcars.

*The above weights and zones should be used as starting points (rules of thumb). Packaging and construction may affect the correlation between zones, weight and drop height. Consult a Shockwatch Regional Manager for further information on selecting the sensor that is right for your application.

MAG 2000 selection guide

EXCEPTIONS TO THE RULES - FREIGHT VEHICLE USE:

The MAG 2000 is the ideal product to monitor shipments in excess of 300 lbs., however, there are some specific situations to be aware of when prescribing a MAG 2000 to a customer for rail and truck applications:

- 1) Be aware that the MAG 2000 can be mounted to the freight vehicle itself in addition to the shipment. When using a MAG unit in this manner of transportation it is wise to find out the mode of transportation the shipment will encounter. For example, if a shipment is going truck and air only, the primary concern will be vertical impacts that are created when the truck goes over potholes or speed bumps too fast or if a plane lands hard. If a shipment is going rail at some point, there should be concern for horizontal impacts that occur during railcar couplings.
- 2) If your customer wants the ability to view the MAG 2000 at all times, placement of the unit will affect the selection of the proper sensitivity.

If your customer wants to mount a MAG 2000 onto the freight vehicle, contact a Shockwatch Regional Manager to aid you in selecting the best G sensitivity for your application.

WHAT TO KNOW WHEN PLACING AN ORDER

When placing a MAG 2000 order, please have two pieces of information available:

- The sensitivity level (See selection graph)
- The mounting orientation of the unit: HH, VV, or VH (See explanation below).

Mounting Orientation	When To Order What
HH	Will respond only to horizontal impacts, but must be mounted to a horizontal surface (top, bottom, floor). The HH will detect impacts from any horizontal direction. i.e. N, NW, W, SW, S, SE, E, NE.
VV	Used in applications where only vertical impacts are a concern, (such as on trucks), but must be mounted to a vertical surface. A VV unit can be used in combination with an HH to provide omnidirectional impact monitoring.
VH	Although always mounted on a vertical surface, it will detect horizontal impacts in one axis only (north/south or east/west) Therefore it requires two VH units mounted on adjacent sides to detect all horizontal impacts. It is best to use HH and VV units where possible.



Mounting Orientation

G Level

Ordering an incorrect mounting orientation can result in incorrect activation data, so please contact a Shockwatch Regional Manager if you are in doubt.

MAG 2000 Ordering Information

PRODUCT	PART #	MIN QTY.	WEIGHT (in lbs.)	WEIGHT (in kilos)	SPECIAL ORDERING NOTES
MAG 2000 - M21 (standalone unit)	M21 or M21A	12	3	1.36	None - any carrier
MAG 2000 - M22 (single unit/bracket)	M22 or M22A	12	5	2.27	None - any carrier
MAG 2000 - M23 (two units/bracket)	M23 or M23A	12	6	2.72	None - any carrier

running the program

MAG 2000

As the MAG 2000 can be considered an extension to the Shockwatch label line, it is also a complete program that must be communicated throughout the handling chain, from shipper to receiver.

Use these 5 simple steps to educate handling personnel:

1. Establish activation trends based upon packaging restrictions or testing.
2. Alert your customer's personnel
3. Alert their carriers.
4. Alert their customers.
5. Ship your products with units and monitor for a reduction of damage incidents.

Because the MAG 2000 is a reusable tool, communication at the consignee level is crucial if your customer wishes to have the MAG units returned to them.

The program consists of letters (see CD Rom), a placards, alert stickers, companion labels and customer training.

OPTIONAL ACCESSORIES

Companion Label

Similar to the Shockwatch and Tiltwatch monitoring programs, the effectiveness of a MAG 2000 program is based upon awareness and education. The psychological impact of the indicator is as much a factor as the sensor itself. For this reason, we recommend MAG 2000 companion label.

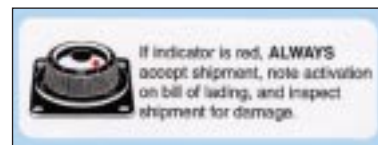
The Companion Label dramatically increases the exposure of your MAG unit and also explains receiving procedures for an activated unit.

The label can be used with Shockwatch Labels or MAG 2000s, and is available in English, multilingual unit 1 (English, German, French, Spanish), or multilingual 2 (Japanese, Chinese, Korean, English). Labels are shipped in perforated roles of 200, 500 or in single pieces.



Alert Sticker

Each MAG unit is shipped with 10 Alert Stickers to be placed on the bill of lading. These stickers increase awareness to your carriers.



Mounting Brackets

MAG 2000 mounting brackets allow for permanent installation of the brackets. This 3.5" x 5.5" bracket will allow you to interchange the MAG units with different G sensitivities based upon the weight of the shipment or cargo load, or remove MAG units altogether when the container is not in use.



Placards

For applications in the rail industry, a specially designed placard can be mounted in terminals, loading docks, or on the vehicle itself to warn personnel that excessive rail car humping will cause activation of the MAG unit.

Placards are available in card stock or in metal.

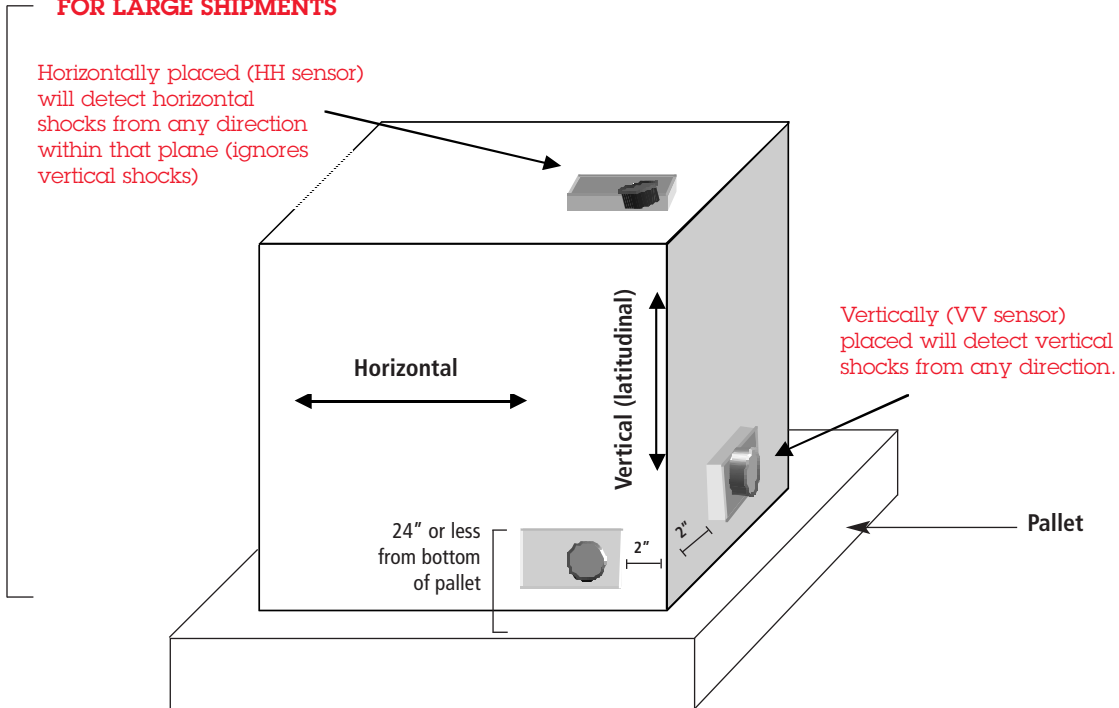


MAG 2000 **how to mount it**

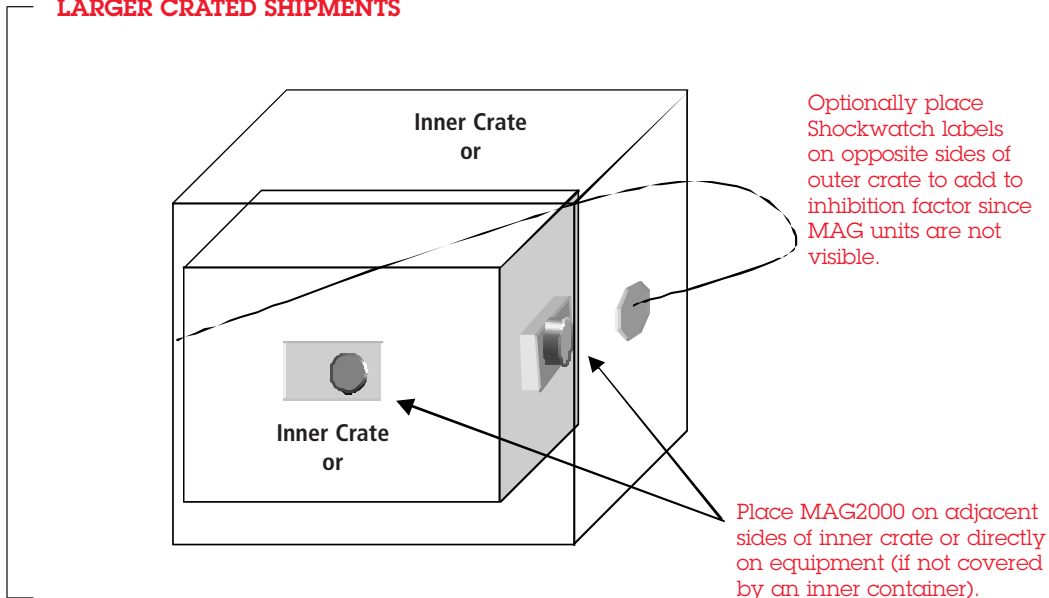
For temporary installation an extremely aggressive tape is available. For more permanent installs, the MAG 2000 can be directly screwed into a case, crate or vehicle using four predrilled screw holes located on the unit. Shockwatch can also provide a two unit mounting bracket that will allow a MAG unit to be replaced or removed when necessary.

Note: Please refer to the "What to know when placing an order" for information on using HH vs VV vs VH sensors. (see page 16)

FOR LARGE SHIPMENTS



LARGER CRATED SHIPMENTS



MAG2000

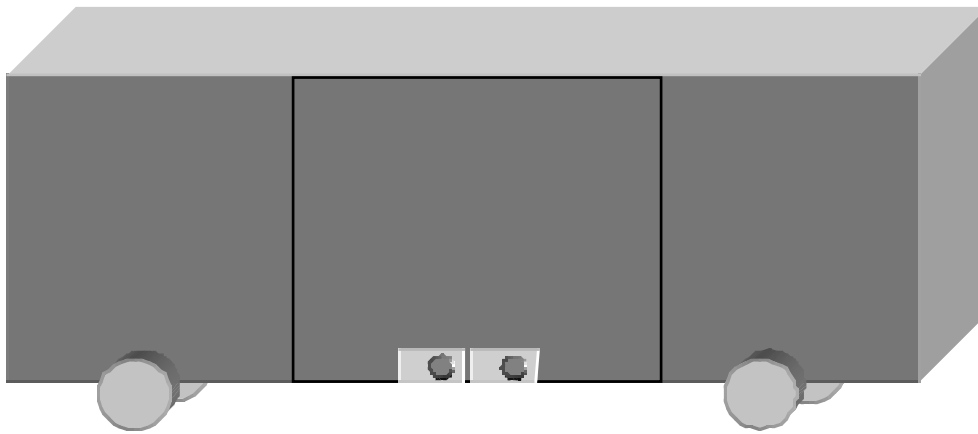
MAG 2000 how to mount it

If you plan to mount the MAG 2000 onto a rail car or truck, it is recommended that you contact Shockwatch for help in selecting your unit.

Rail Car Placement

The MAG 2000 is recommended for outside of rail car, although it can be mounted on the inside. In either case, mount at the center, near the floor, on the main frame of the car (below door area).

The MAG 2000 will read all impacts in the same plane that the device is mounted. By placing the unit on the side of the car, it will read all impacts equally from both longitudinal (along the track) and vertical impacts. Note: If using more than one MAG2000 unit, mount them side by side.



Truck Placement

Mount the MAG 2000 on opposite ends of the truck by the front swivel and back door (mounted vertically). This will monitor driving conditions on both ends of the vehicle. Both hydro-cushion and standard trucks will have the MAG2000 mounted the same way, however, with different sensitivities.

