



Watson Industries Application Notes

Target Drone Compass Systems

Target drones require a navigation system that will provide accurate heading information to the remote pilot. A low cost, accurate and reusable magnetometer solution is needed to supplement the other attitude sensors in the aircraft.



Any electronic sensor package used in a target drone needs to be small in size because space in the airframe is at a premium. The device also needs to be lightweight since drones are not designed to carry much excess payload. Low power consumption is an ideal characteristic for an airborne electronic device as well.

Watson Industries developed the FGM-301/99 to meet the MIS40175 U.S. Army Missile Command specifications. It provides an accurate triaxial magnetometer output while maintaining its low price.

Technical Challenges:

The primary challenges associated with this application are making a high quality heading sensor that is waterproof to 6 feet at a low cost. The price of the sensor is doubly important since target drones can sometimes be destroyed or damaged and the cost of the loss of a drone must be minimized. The heading sensor must be waterproof because the drones parachute into the sea after they are used, and the sensor could be as much as 6 feet underwater for several hours before the drone is recovered.

The Watson FGM-301/99 was designed exclusively to meet and overcome these challenges. It is inexpensive, weighs less than ¼ lb., is waterproof to 6 ft., draws less than 0.25W of power, and still maintains an absolute error spec of less than $\pm 2.0\%$

Watson Experience:

Watson Industries has been producing fluxgates for target drone compass systems since 1996.



Watson Industries, Inc.

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Requirements:

- MIS40175 U.S. Army Missile Command Specification
- Low Weight
- Low Power
- Magnetically clean installation location
 - Use non-magnetic hardware and connector for FGM-301/99
 - Keep away from motors, relays, batteries, and current carrying conductors
 - Test with a conventional compass to find a suitable location.

Applicable Products:

- FGM-301/99

Typical Options:

We are able to accommodate your custom needs. Shown below is a listing of our most common custom modifications.

- Custom specifications – For certain applications, customers require specifications that are different from our standard units. Watson Industries engineering is willing and able to accommodate these needs.
- Input Voltage – Many different input voltages can be accommodated.
- Sensor Ranges – The ranges for most of our sensors can be expanded or reduced to meet your requirements.

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