

GMS-750RS

Rotor-Stator Gap Measurement



Model GMS-750RS Gap Measuring System

Kaman's proven eddy current sensor technology incorporated into an easy to use turnkey instrument specifically designed to measure rotor-stator gap in large scale power gen applications.

Features

- ❖ Long insertion depth
- ❖ Adjustable insertion stops
- ❖ LED read out of gap in inches or millimeters
- ❖ All metal construction
- ❖ AC input power via wall transformer power supply
- ❖ Replaceable target springs
- ❖ Pushbutton calibration
- ❖ Pushbutton tare

Benefits

- ❖ An accurate reliable means to measure rotor-stator gap
- ❖ Eliminates operator dependent variations in collected data

Gap Measurement

The removal, repair and reinstallation of a rotor in hydroelectric generating stations is a costly endeavor. Added to the actual cost of the repair is the lost revenue during the downtime. After repair, reinstallation of the rotor includes an extensive alignment process. Rotor-stator gap measurements are taken, and computer programs provide the maintenance engineers with the appropriate adjustments to be made. The accuracy of these measurements directly affects the number of measurement/adjustment iterations required to bring the rotor-stator alignment into spec.

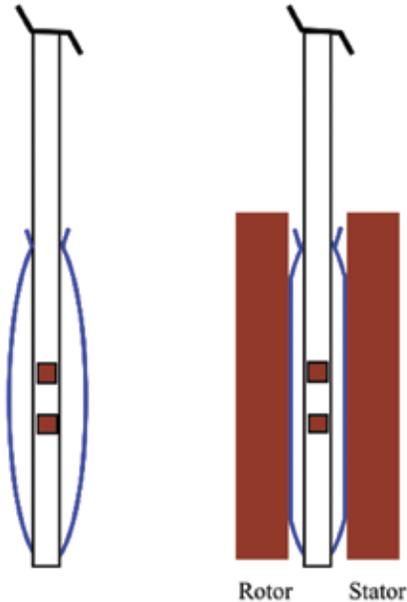
Theory of Operation

Eddy current technology for position/displacement sensing uses a wire wound coil mounted in a threaded barrel to induce a current in the surface of an electrically conductive target. The nature of rotor and stator surfaces is not conducive to accurate measurements. The GMS-750RS overcomes this by incorporating targets in the form of leaf type springs that are compressed together when inserted between a rotor and stator. The distance sensed is in fact the distance between the two target springs. This concept ensures the eddy current sensor mounted in between sees a consistent target ensuring maximum performance.



In Operation

As shown below, the steel spring targets are deflected by the rotor and stator when the instrument is inserted in the gap between them.



As the rotor stator gap varies, the sensor will detect a change in the distance between the two springs and vary the output on the digital display to indicate the rotor-stator gap.

Calibration

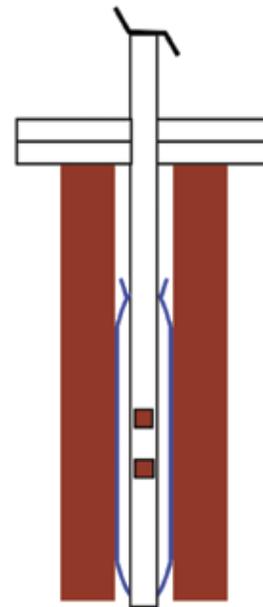
The unit is provided with full factory calibration. If desired/required, field calibration is possible through the multi-use push button interface, and red/green LED. In normal operation the LED will glow red to indicate power is on and the unit is operational. Depressing and holding the pushbutton for 2 seconds puts the unit into calibration mode, a rapid flashing green LED indicates the unit is in calibration mode. Using a suitable fixture to depress the two springs to a 1.000" (25.4mm) overall thickness and depressing the push button will set the full scale dimension. The flashing of the green LED will slow. Depressing the two springs to a 0.250 (6.35mm) overall thickness and depressing the push button will set the minimum scale dimension. The LED will return to red indicating run.

Tare

Once calibration is complete, the push button servers to tare the output to a known gap. Simply insert the spring end into a gap equal to the tare distance, or depress the springs to the tare distance and momentarily depress the push button. The electronics will tare the output to reflect the tare distance.

Insertion Depth

Stops are provided for the user to set an insertion depth. This is important as the gap between misaligned rotor-stator assemblies can change with the depth that the measurement is made. See below.



Simply position the stops into the holes provided to limit the maximum depth of the sensor and target springs.

Benefits

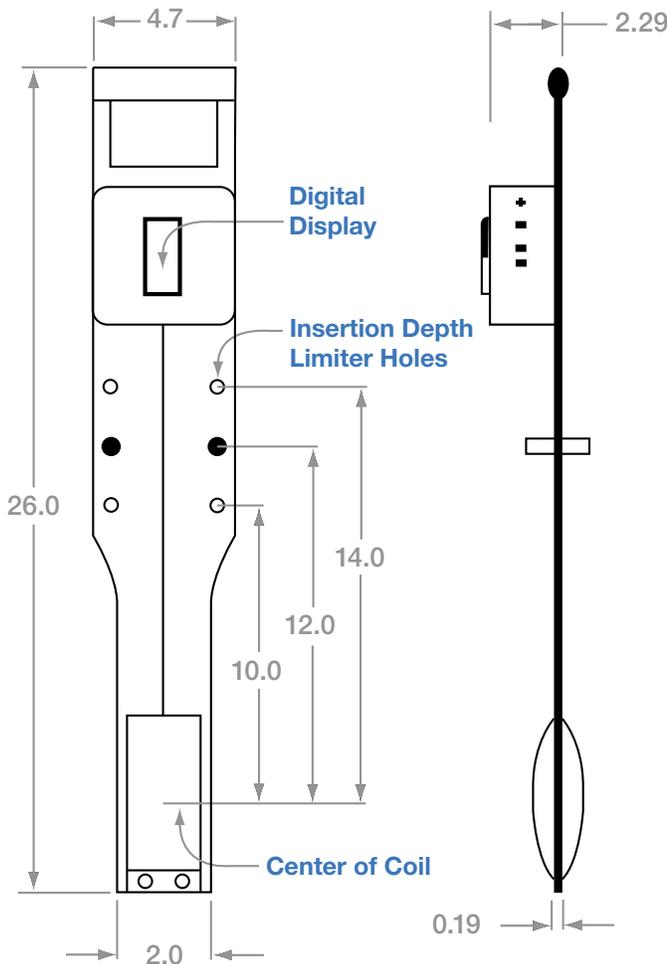
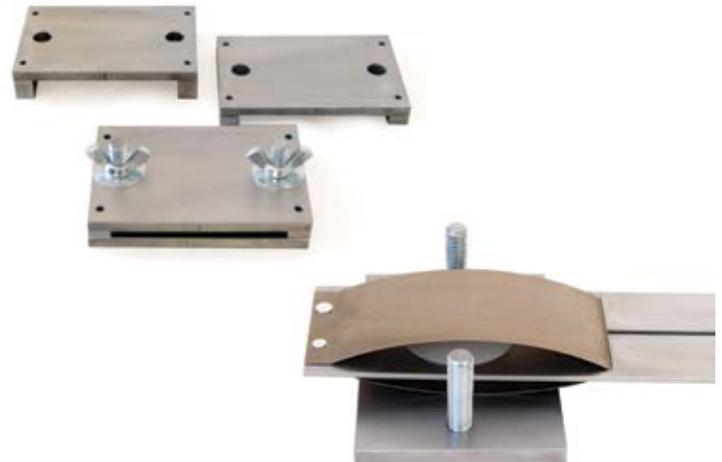
The system provides accurate and repeatable gap measurements between 0.250" and 1.000", with a 0.001" resolution (6.35mm and 25.4mm with a 10 um resolution). The simplicity of the design eliminates operator variables while dramatically reducing the overall time it takes to align the rotor to the stator.

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SPECIFICATIONS

Gap Range	0.250" - 1.000" (6.35mm-25.4mm)
Resolution	0.001" (10um)
Operating and storage temperature range	0-70°C (32-158°F)
LED display	3-1/2 digits
Indicators	Run Calibrate
Wall transformer supply	100-240VAC 50-60 Hz

OPTIONAL FIELD CALIBRATION TOOL



Complete instrument includes:

1. GMS-750RS unit.
2. Power supply (wall transformer)
3. Operating instructions

The GMS-750RS is calibrated at the factory prior to shipment. Field calibration is possible. The only requirement is to be able to accurately mimic a 0.250" (6.35mm), 0.500" (12.7mm) and 1.000" (25.4mm) rotor-stator gap. This can be accomplished with a granite surface block, appropriate precision ground spacers, a flat metal plate and the ability to compress the target springs with the flat metal plate (some force is required).

An optional field calibration tool is available that includes a base plate, three compression plates (0.250", 0.500" & 1.000"), threaded studs and wingnuts to make spring compression easy and repeatable.