



Model SS-1-8 Shaft Sender

The Aetna Engineering Model SS-1-8 shaft sender functions as a sensing device for the Aetna Engineering line of Precision Sensitive Digital Tachometers. The SS-1-8 gives an output pulse whenever a metallic object (target) comes close to the sensing face. The SS-1-8 may be mounted in a position so that it senses the passage of bolts or other metallic objects on a rotating object such as a crankshaft pulley, propeller shaft or transmission coupling. The pulses created are then processed by the tachometer to generate accurate RPM information. The following notes will assist in installation and adjustment.

1. The SS-1-8 should be mounted in a position so that the targets pass in a “slide by” configuration with a clearance distance of approximately one eighth of an inch. The maximum operational distance is a function of the diameter of the SS-1-8 and the material type and size. The minimum distance is limited to the spacing which will assure that no contact will occur between the sensor and the object when allowances are made for run out, end play, vibration and eventual paint build-up or corrosion of the object.

Caution: any physical contact with the sensing surface of the Model SS-1-8 by the rotating equipment may cause permanent damage to the unit and is not covered under warranty.

2. The maximum RPM which may be indicated will be limited by the minimum period of time the object is within the actuating distance of the sensor and the maximum frequency of the signal. For the model SS-1-8 the minimum time required for actuation is one millisecond and the maximum pulse rate is 500 hz. It follows that objects with a larger surface area or closer to the axis of rotation will permit operation at higher RPM. For example, a ½” bolt on a 7” diameter bolt circle at 0.1” slide by spacing would function to slightly over 2500 RPM.

3. The tachometer must be matched to the number of pulses (targets) per revolution. Our standard tachometers will give the correct indication when there are two, three, four, six, or eight pulses per revolution. Aetna Engineering can supply custom tachometers for other ratios. The targets should be evenly spaced throughout the rotation to provide an even pulse train during operation.

4. The SS-1-8 sensor should be mounted by positioning it in an 18mm hole in a customer furnished bracket. The bracket should be of sufficient rigidity to prevent vibration or movement which would cause erroneous readings or permit the sensor to contact the rotating equipment. Preferably the bracket should be mounted to the structure of the rotating machinery in order to minimize movement in relative position between the sensor and the machinery being measured. Use very little force (less than 8 foot-pounds) when tightening sender fittings.

5. The cable for the Model SS-1-8 should be securely dressed to a clean dry location where the three conductors may be joined in junction block to a three conductor 18 gauge (or heavier) cable which is routed to the Precision Sensitive Digital Tachometer(s). The sensor draws a maximum of 200mA and is rated at 10 to 30 Volts D.C. The output is of the NPN open collector type, it will pull-down on a load when a target falls within the sensing zone. The electrical connections should be made from the sensor to the tachometer as follows:

Sensor Lead	Tachometer terminal
-----connects to-----	
Brown	+12V (IGN.)
Black	POINTS (SIG.)
Blue	GROUND (NEG.)

Caution: Note that the sensor Black wire is **NOT** connected to negative! Be extremely cautious that all connections are made correctly as listed above. Even momentary incorrect connection may permanently damage the sensor.

The connections should be made using accepted standard wiring practice for shipboard wiring and should be well insulated and protected from any accumulation of dirt or moisture.

6. The 12 volt power should be connected into the system at the tachometer. If an installation includes multiple tachometers, the tachometers should be connected in parallel; i.e. Ground to Ground, Signal to Signal, and +12V to +12V with power connected into just one of the tachometers. The SS-1-8 sensor will drive up to ten tachometers in parallel.

7. After the sensor and tachometer(s) are installed and wired the system may be checked and adjusted if necessary. Apply power to the tachometer without starting the machinery. Check the function of the sensor by monitoring the signal voltage as the target is moved into range with the sensor. The voltage should drop when the target is brought into position adjacent to the sensor by rotating the machinery. The voltage should drop as each target just begins to overlap the sensor and should remain low until the target has passed almost completely beyond the sensor. If the voltage fails to drop, test the sensor function by placing a screwdriver blade flat against the sensor, if the sensor fails to respond with this test, check for correct wiring and power to the sensor. If these are correct, the sensor is faulty and must be replaced.

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