

# Non-Contact Proximity Probe System

An industrial non-contact proximity probe typically consists of a coil, a mandrel, and a cable. Here's how these components are combined to make the probe:

1. **Coil:** The coil is typically made of a fine wire wound around a former, which is usually made of a non-conductive material. The coil is a critical component of the probe, as it generates the electromagnetic field that interacts with the target object.
2. **Mandrel:** The mandrel is a tubular structure that is typically made of a non-magnetic material, such as stainless steel or titanium. The coil is wound around the mandrel, which helps to keep it in place and maintain its shape.
3. **Cable:** The cable is used to connect the probe to the driver and signal conditioning electronics, which are typically located outside the sensing environment. The cable is typically made of a shielded coaxial cable that is designed to minimize noise and interference.

To assemble the probe, the coil is wound around the mandrel, which is then typically coated with a layer of insulating material to protect the coil from the environment. The cable is then attached to the coil, and the entire assembly is typically mounted on a support structure, such as a bracket or flange.

When the probe is in operation, the electromagnetic field generated by the coil interacts with the target object, which induces eddy currents in the object. These eddy currents generate a secondary electromagnetic field that is detected by the coil, and the resulting signal is then transmitted through the cable to the driver and signal conditioning electronics for processing and analysis.

An industrial non-contact proximity probe typically consists of the following components:

1. **Sensor Head:** This is the part of the probe that detects changes in position and proximity of the target. It typically uses electromagnetic or capacitive sensing technology.
2. **Signal Processing Unit:** This unit is responsible for processing the sensor signals and converting them into electrical signals that can be read by a monitoring system or control unit.
3. **Amplifier:** The amplifier boosts the signal from the sensor head to improve its accuracy and reliability.
4. **Cable:** This connects the sensor head to the signal processing unit and can be shielded to reduce electromagnetic interference.
5. **Mounting Hardware:** This allows the probe to be securely attached to the machine or

equipment being monitored.

6. Power Supply: The probe requires a power source, which can be supplied by batteries or an external power supply.
  7. Output Display: This component displays the output of the probe, which can include the distance or position of the target.
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