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Application of Rotary and Linear Sensors in Laser Cutting Machines

Lasers cutting machines are used for cutting mild steel, stainless steel, and aluminum plates. The laser cutting process is highly accurate, yields excellent cut quality, has a very small kerf width and small heat affect zone, which makes it possible to cut very intricate shapes and small holes.

Working of Laser Cutting Machine :

The laser beam is a column of very high intensity light, of a single wavelength, or colour. In the case of a typical CO2 laser, that wavelength is in the Infra-Red part of the light spectrum, so it is invisible to the human eye. The beam is only about 3/4 of an inch in diameter as it travels from the laser resonator, which creates the beam, through the machine's beam path. It may be bounced in different directions by a number of mirrors, or "beam benders", before it is finally focused onto the plate. The focused laser beam goes through the bore of a nozzle right before it hits the plate. Also flowing through that nozzle bore is a compressed gas, such as Oxygen or Nitrogen. The control of the flow of the gas can be controlled by using Rotary Position Sensor.

Focusing the laser beam can be done by a special lens, or by a curved mirror, and this takes place in the laser cutting head. The beam has to be precisely focused so that the shape of the focus spot and the density of the energy in that spot are perfectly round and consistent, and centered in the nozzle. By focusing the large beam down to a single pinpoint, the heat density at that spot is extreme. The high power density results in rapid heating, melting and partial or complete vaporizing of the material. When cutting mild steel, the heat of the laser beam is enough to start a typical "oxy-fuel" burning process, and the laser cutting gas will be pure oxygen, just like an oxy-fuel torch. When cutting stainless steel or aluminum, the laser beam simply melts the material, and high pressure nitrogen is used to blow the molten metal out of the kerf.

On a CNC laser cutter, the laser cutting head is moved over the metal plate in the shape of the desired part, thus cutting the part out of the plate. The movement of the laser head can be sensed using Linear or Rotary Position Sensors.

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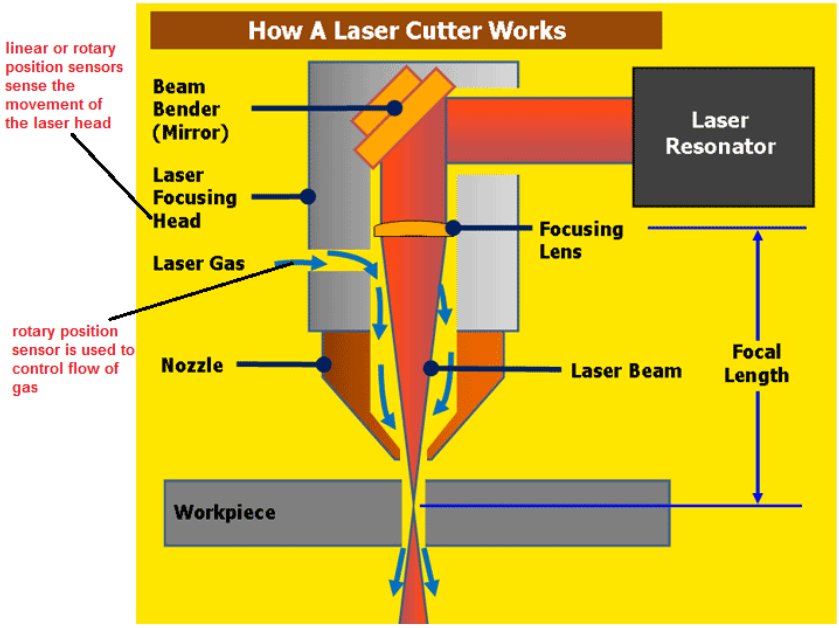
A capacitive height control system maintains a very accurate distance between the end of the nozzle and the plate that is being cut. This distance is important, because it determines where the focal point is relative to the surface of the plate. This critical distance maintaining can be achieved using Precision Linear Position Sensors. Cut quality can be affected by raising or lowering the focal point from just above the surface of the plate, at the surface, or just below the surface.



Application of our product Rotary & Linear Sensor in Laser cutting machine

Working of Rotary and Linear sensor in Laser Cutting Machine :

Rotary Hall Sensors generate a train of equally spaced pulses as it rotates. The output of rotary encoders is measured in pulses per revolution which is used to keep track of position or determine speed during the laser cutting process. Contactless hall technology sensors give a stable output even in case of vibrations.

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During the movement of the laser cutting head the laser cutting head is moved over the metal plate in the shape of the desired part, and this operation takes place in the correct manner due to the use of a rotary sensor in it., which helps the laser cutter to sense the metal plate.

Vertical movement of the laser focussing head by using the linear sensor.The Linear sensor detects the changes in positions and makes it possible to detect the amount of displacement of the object. It can also be used to maintain a predefined distance by feedback sensing.