ABSTRACT

Capacitive sensor is one of method to measure electrical quantity from object based on changes of measured capacitance value due to variation of parameters, namely permittivity, plate dimensions and distance between plates. The shape of sensor still in form of parallel plates in generally. Therefore, in this research the development to change the shape of sensor to flat-plate, whose purpose is to simply testing only with scaning system, with putting the sensor above the test object. The shape of sensor consists of two electrodes with function as transmitter and receiver. Because change of the shape then need is to be done study fisibility at sensor parameters, in this case the parameter is the dimensions and distance between plates which aim to obtain a sensor size that fisibel so that it can work as a capacitive sensor. Study fisibility sensor do with software of COMSOL Multiphysics®. In addition to the sensor, in this study also use an electric CV-Converter circuit to converts voltage to a capacitance value. Based on the research that has been done, the chosen area of each electrode transmitter and receiver is 64 $cm^2$with the distance between the electrode is 2,5 cm. Based on the result of seen form capacitance value this sensor testing has been able to detect the present or absent of metal in the test object, but can only distinguish the object based on the metal size and the depth of the distance to the sensor but cannot distinguish the type of metal detected.

Key word : *Capacitive sensor, Flat-plate capacitor, CV-Converter, Capacitance simulation*