INTRODUCTION

■ Principle of electrostatic sensor detection

- Around electrified object, an electric field that is proportional in strength to the amount of charge is produced. Electrostatic sensors detect the intensity of this electric field and calculate it as electric potential.
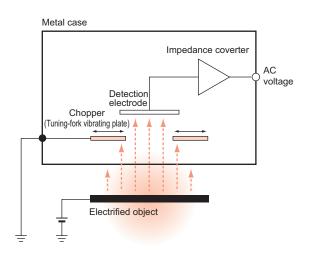
Detection of electric field

- When a detection electrode is brought close to an electrified body, an electric charge that is proportional to the intensity of the electric field is induced in the detection electrode due to "electrostatic induction". The electrostatic sensor opens and closes a tuning-fork vibrating plate called a chopper in front of the detection electrode in order to cancel out DC noise and perform higher precision measurement. The sensor detects the intensity of the electric field by receiving the induced electric charge as a communication signal.

Conversion to electric potential

- Electric potential is proportional to the intensity of the electric field, but the intensity of the electric field gets smaller as it gets further away from an electrified object. Therefore, the electrostatic sensor sets a distance between the electrified object and the sensor using a controller and a corrected calculation of the electric potential is performed.

■ Characteristics based on the principle of electrostatic sensor detection

- Since an electric field relies on the measurement distance, you need to fix the sensor at a set distance in order to perform a high precision measurement. The electric field that is produced by an electrified object spreads concentrically out from the electrified object. Therefore, the electrostatic sensor that detects the electric field measures a wider range as the measurement distance increases.
  Moreover, the existing electrostatic sensors and electrometers have the same range characteristics since they all detect the electric field.

Metal case
Impedance coverter
AC voltage
Detection electrode
Chopper (Tuning-fork vibrating plate)
Electrified object