

# Capacitive Proximity Sensor - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2024 - 2029)

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## Abstracts

The Capacitive Proximity Sensor Market size is estimated at USD 2.70 billion in 2024, and is expected to reach USD 3.82 billion by 2029, growing at a CAGR of 7.20% during the forecast period (2024-2029).

A capacitive proximity sensor is a sensing device designed to detect metallic and non-metallic targets. It may detect lightweight or small objects that mechanical limit switches cannot see. They use dielectric principles of capacitance to establish a sensing field near the sensor's face, creating a detecting zone. These sensors operate by recording a change in the capacitance read by the sensor.

### Key Highlights

The amount of capacitance varies depending on the size and distance of the sensing object. An ordinary capacitive proximity sensor is similar to a capacitor with two parallel plates, where the capacity of the two plates is detected. The sensor consists of a high-frequency oscillator and an amplifier. When an object approaches the sensor's detection surface, the capacitance of the loop varies, causing the high-frequency oscillator to vibrate. Amplifiers transform the oscillation and stop states into electrical signals, which are then turned into binary switching signals.

Capacitive proximity sensors have a wide sensitivity band, enabling them to detect objects through non-metallic walls. They are known for their long operational lifespan, making them reliable for various applications. These sensors are highly sensitive and can accurately detect very small deflections, making them suitable for various applications like motion, displacement, chemical composition, electric field, pressure,

acceleration, fluid level, and fluid composition.

The growth in manufacturing facilities and production plants is a major driver for the capacitive proximity sensors market. These sensors can simplify and decrease the time consumption in production functions while enhancing the dependability, accuracy, and involvement of a low task force.

Moreover, while capacitive proximity sensors offer numerous advantages, they have some limitations in sensing capabilities that can hinder their growth. Capacitive proximity sensors are sensitive to the dielectric properties of materials. While they can detect a wide range of materials, including metals, liquids, and plastics, they struggle with certain materials that have low dielectric constants or are highly conductive.

The COVID-19 outbreak and lockdown restrictions worldwide severely affected industrial activities. The effects of the lockdown include labor shortages, disruptions in the supply chain, lack of availability of raw materials utilized in the manufacturing process, fluctuating prices that could force the production of the final product to increase and go beyond budget, shipping problems, etc.

## Capacitive Proximity Sensors Market Trends

### Consumer Electronics to Witness Major Growth

In capacitive touch technologies, sensors have replaced buttons and membrane switches across a larger range of consumer electronic devices, from smartphones and tablets to laptops and other similar electronic devices.

Capacitance-based touch sensors convert a surface area into several sensing opportunities by utilizing an electrostatic field and sensing very small changes in the capacitive field. Moreover, sensors like these can detect and quantify anything conductive or have a different dielectric than air, facilitating non-mechanical methods of receiving stimuli.

This technology lends itself equally well to buttons, sliders, switches, touch pads, touch screens, and proximity sensors, enabling designers to take smartphone design to much higher levels. As a result, there are a variety of intelligent features that can be implemented using capacitive touch sensing in mobile devices.

With capacitive sensing, creating a special gesture interface allows users to operate

phones with a single hand and control various functions using their thumb. For instance, a simple four-segment capacitive slider sensor on the side of the phone enables such features as swipe up, swipe down, flick up, flick down, single tab, double tab, long press, etc.

These features may be used with all smartphone applications to browse between screens, scroll a document up and down, or select or deselect an icon. Such a single-handed interface can increase the phone's convenience and simplicity, thus enhancing the user experience. According to Ericsson, by 2023, 6.718 billion smartphone mobile network subscriptions will be adopted across the globe, which would further boost the market's growth.

### Asia-Pacific to Hold Major Share

Asia-Pacific is anticipated to record the highest growth rate during the forecast period, with the noteworthy installation of industrial robots in several countries, including China, Japan, India, South Korea, and Taiwan.

China is dominating the regional adoption rate of sensors for robotic applications due to the massive deployment in the country's dominating automotive and semiconductor manufacturing industries. Capacitive proximity sensors are used in robots to avoid collisions and perform tasks safely and efficiently. Moreover, these sensors are used to accurately position and guide parts during assembly or other manufacturing processes.

The growing government aid in improving the advanced manufacturing sector will positively impact the market growth rate. The government of China launched "Made in China 2025", a state-led industrial policy that seeks to make China dominant in global high-tech manufacturing.

By 2025, the country aims to exceed its average annual operating income growth rate by 20% in the robotics industry. The five-year plan set out objectives to expand the breadth and depth of robotic applications to continue to increase the number of robots in the country.

It also aims to promote a more stable and robust supply chain and better standardize the industry. As robotics involve various types of sensors in touch, proximity detection, and so on, the sector's growth is set to boost the market growth rate.

## Capacitive Proximity Sensors Industry Overview

The capacitive proximity sensor market is fragmented and studied, and the company intends to achieve a competitive edge by expanding its product offerings to specific applications, strengthening its distribution channels and presence, and offering greater customization of its products. Some significant players include Rockwell Automation Inc., Omron Corporation, Infineon Technologies AG., Fargo Controls Inc., and Pepperl + Fuchs GmbH, among others.

October 2023 - AutomationDirect incorporated Balluff BCS series capacitive proximity sensors into their extensive collection of object detection sensors. These sensors are offered in various styles, such as 12-30 mm tubular, 50 mm round, and small rectangular bodies, and they provide sensing distances of up to 30mm. These advancements are also projected to amplify the market's potential.

September 2023 - ROHM disclosed the development of a compact 2.0 mm x 1.0 mm proximity sensor, known as the RPR-0720, specifically designed for applications that necessitate attachment/detachment and proximity detection. This novel compact VCSEL proximity sensor significantly contributes to wireless earbuds and wearable devices' enhanced miniaturization and battery capacity.

Additional Benefits:

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