# The Bosch Motion Sensor Story
## Total Cost of Ownership Advantage

The up-front purchase price of a product is usually cited as one of the most important factors when making a buying decision. However, the per-unit cost of a motion detector is just a small part of the overall picture.

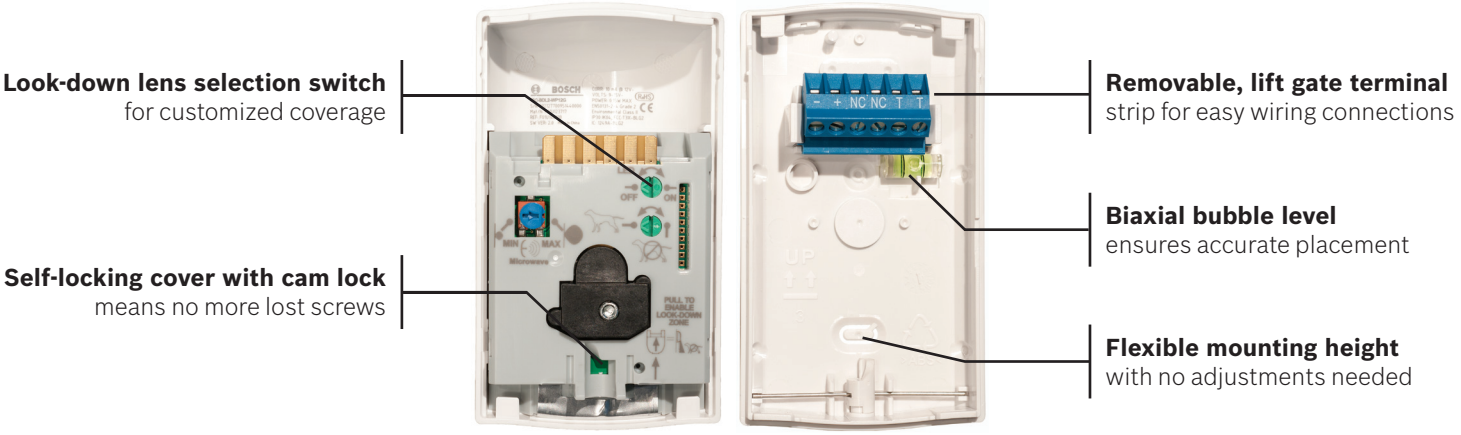
It is much more important to understand the Total Cost of Ownership (TCO) over the life of the product. This includes consideration of the hidden or indirect costs associated with installation, performance, and maintenance.

See below to learn how Bosch delivers the lowest TCO.

## Installation Cost

When installing an intrusion alarm system, labor can be the most significant cost component. Getting the job done faster and more accurately can greatly improve your bottom line.

Unique features of Bosch detectors can help speed installation by an average of 43 percent compared with models from other manufacturers. Watch our Faster Install video at **bit.ly/fasterinstall**.




**Estimated labor cost per 1,000 installed detectors:**

| Brand | Install time (min) | Total Cost* |
|---|---|---|
| Bosch | 5:58 | $3,978 |
| Competitor A | 7:44 | $5,156 |
| Competitor B | 9:13 | $6,144 |
| Competitor C | 10:52 | $7,244 |

Source: Timed exercise with local installer
*Based on estimated $40/hour labor rate

Bosch motion detectors produce real installation cost savings of up to $3,266 per year.

## Performance Cost

Intelligent intrusion detection is a delicate balance between responding to real security breaches and ignoring false alarm sources, such as small animals or headlights from passing cars. Regardless of purchase price, a detector that performs poorly in either of these tasks cannot be considered a good value.

With decades of experience and an unwavering dedication to high-quality and high-performing products, Bosch offers detectors that provide best-in-class false alarm immunity and catch performance. Bosch detectors are sold globally and designed for global approval of all regulations. Therefore their performance and durability far exceeds most competitors that sell different models in each region that only meet regional regulations.

### Competitive Benchmarking: Dual sensor detectors (PIR and microwave Doppler radar)

| Brand | Model | Technology | Catch performance | False alarm immunity |
|---|---|---|---|---|
| Bosch | ISC-CDL1-W15 | Dual | 98% | 100% |
| Competitor A | Model 1 | Dual | 53% | 89% |
| Competitor C | Model 1 | Dual | 90% | 56% |
| Competitor C | Model 2 | Dual | 68% | 94% |
| Competitor D | Model 1 | Dual | 91% | 51% |

Source: Controlled test based on UL, EN 50131, VdS, and CCC standards

### Competitive Benchmarking: Dual sensor detectors with anti-mask

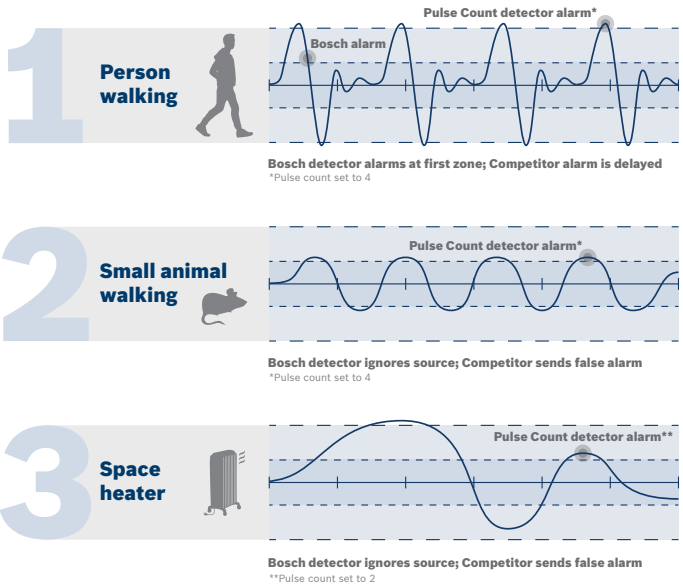
| Brand | Model | Technology | Catch performance | False alarm immunity | Masking detection |
|---|---|---|---|---|---|
| Bosch | ISC-CDL1-W15 | Dual Anti-mask | 98% | 97% | 97% |
| Competitor A | Model 2 | Dual Anti-mask | 49% | 79% | 54% |
| Competitor C | Model 3 | Dual Anti-mask | 75% | 37% | 36% |
| Competitor E | Model 1 | Dual Anti-mask | 48% | 83% | 33% |
| Competitor E | Model 2 | Dual Anti-mask | 64% | 71% | 49% |
| Competitor F | Model 1 | Dual Anti-mask | 70% | 74% | 19% |
| Competitor G | Model 1 | Dual Anti-mask | 50% | 31% | 10% |

Source: Controlled test based on UL, EN 50131, VdS, and CCC standards

How does Bosch achieve this performance advantage?

**High quality optics** – Increased focal length allows us to gather more energy from the field of view, resulting in better performance

**Advanced signal processing** – First Step Processing adjusts the detector's sensitivity based on signal amplitude, polarity, slope, and timing, to accurately differentiate intruders from false alarm sources. In TriTech models, each sensor (PIR and microwave Doppler radar) is processed individually, and the alarm relay does not activate unless both sensors agree there is an alarm. Sensor Data Fusion uses sophisticated software to constantly adjust and balance the sensitivity of multiple sensors, resulting in the most accurate alarm decision.




**Advanced microwave Doppler radar** – Microwave Noise Adaptive Processing uses pattern recognition circuitry to identify and ignore repetitive false alarm sources. It adjusts to background disturbances to reduce false alarms without sacrificing the ability to respond to an intruder.

**Dynamic temperature compensation** – The detector automatically monitors the ambient temperature and intelligently adjusts its signal processing to maintain its ability to identify human intruders at critical temperatures. As a result, Bosch motion detectors provide best-in-class performance at elevated room temperatures.

**Active infrared anti-mask** – Effectively detects materials being placed in front of or sprayed onto the detector. Patented prism lenses and active infrared detection ensure protection from all known forms of attack including: fabric, tape, paper, metal, plastic, and aerosol spray.

### Estimated cost of false alarm investigation per 1,000 installed detectors:

| Brand | False alarms / year* | Total cost** |
|---|---|---|
| Bosch | 1 | $62 |
| Competitor A | 100 | $6,200 |
| Competitor B | 100 | $6,200 |
| Competitor C | 100 | $6,200 |

Source: Customer interviews and return records
** Based on 1.55 hour on-site investigation at $40/hour labor rate

## Bosch motion detectors produce performance cost savings of up to $6,138 per year.

## Maintenance Cost

Products that break, are defective, or otherwise fail entail costs for repair or replacement.

Bosch products are recognized for their durability and are engineered to meet or exceed the most stringent environmental and handling requirements. Detector optics and electronics are assembled into the front enclosure and sealed with a protective cover to prevent damage during installation. The sealed cover also prevents drafts, dust and insects from entering the sensor and creating false alarms.

In contrast, many competitor detectors have electronics that are exposed and can be easily damaged, or have covers with large holes that allow for ingress of insects or debris.

**Estimated maintenance and replacement cost per 1,000 installed detectors:**

| Brand | Warranty returns* | Replacement labor | RMA processing | Total cost |
|---|---|---|---|---|
| Bosch | 0.2% (2 / year) | $40 | $20 | $120 |
| Competitor A | 2.0% (20 / year) | $40 | $20 | $1,200 |
| Competitor B | 2.0% (20 / year) | $40 | $20 | $1,200 |
| Competitor C | 2.0% (20 / year) | $40 | $20 | $1,200 |

Source: Customer interviews and warranty return rates

Bosch motion detectors produce maintenance and replacement cost savings of up to $1,080 per year.

## The Bottom Line

The Total Cost of Ownership advantage of choosing Bosch detectors is clear:

- 43% faster installation time
- 35% fewer false alarms
- 90% fewer product returns

When you combine these factors with a competitive per-unit price and best-in-class catch performance, both you and your customer win.

**Estimated maintenance and replacement cost per 1,000 installed detectors:**

| Brand | Installation | Performance | Maintenance | Total cost |
|---|---|---|---|---|
| Bosch | $3,978 | $620 | $120 | $4,160 |
| Competitor A | $5,156 | $6,200 | $1,200 | $12,556 |
| Competitor B | $6,144 | $6,200 | $1,200 | $13,544 |
| Competitor C | $7,244 | $6,200 | $1,200 | $14,644 |

That’s a cost savings of up to $10,484 per year!

With the lowest TCO in the industry, Bosch motion detectors protect your bottom line while giving your customers the safety and security they need.