

Four Key Features of Omron Tactile Switches

Introduction

Omron offers a wide variety of mechanical switches used for the purpose of detecting, operating and settings. A tactile switch is used for operating equipment/devices manually to start/stop and to select and change operational settings. Omron tactile switches are supported by many repeated users—and in this white paper, we introduce the four key features of our tactile switches from our unique viewpoint to help readers understand why users continue utilizing them.

Product Lineup

Omron’s wide range of tactile switches are available to suit user needs and requirements such as external dimension, operating environment, tactile feedback and PCB mounting method. There are 13 series of Omron tactile switch products with nearly 300 models as of 2019 (Fig.1).

		6 × 6 mm	12 × 12mm	Others
Standard Tactile Switches (Non-Sealed type)				
PCB Through Hole Terminal	B3F Standard			B3J Hinge lever
				B3W-9 Illuminated
PCB Surface Mounting Terminal	B3FS Standard			B3U Ultra subminiature
	B3AL Long stroke			
Tactile Switches (Sealed type)				
PCB Through Hole Terminal	B3W Standard			B3WN Radial taping package
	B3S Standard			
PCB Surface Mounting Terminal	B3SN Low-profile			
	B3SL Medium stroke			
	B3SE High durability with an ultra-thin structure			

Figure 1 ● Tactile switch line up

Four Key Features of Omron Tactile Switch

Four Key Features

Omron tactile switches are being used across various markets and industries ranging from consumer and commercial fields, including home appliances, office devices, automotive and industrial fields. The most important elements of our tactile switch contribute to our trusted reputation. They include: (1)unbreakable, (2)stable operation, (3)good tactile feedback and (4)customization options. Looking at it from a different angle, we can say that these four elements are the defining features of an Omron tactile switch. Next up, we look at how we built these product characteristics.

Product feature(1):Unbreakable

“Unbreakable” switch means having excellent durability. To achieve high ruggedness, and sophisticated structure, high level of technical skills are required to design the switch parts configuration and select the right materials (Fig.2). With our long experience in the switch business, Omron has established the technology for tactile switches with high durability.

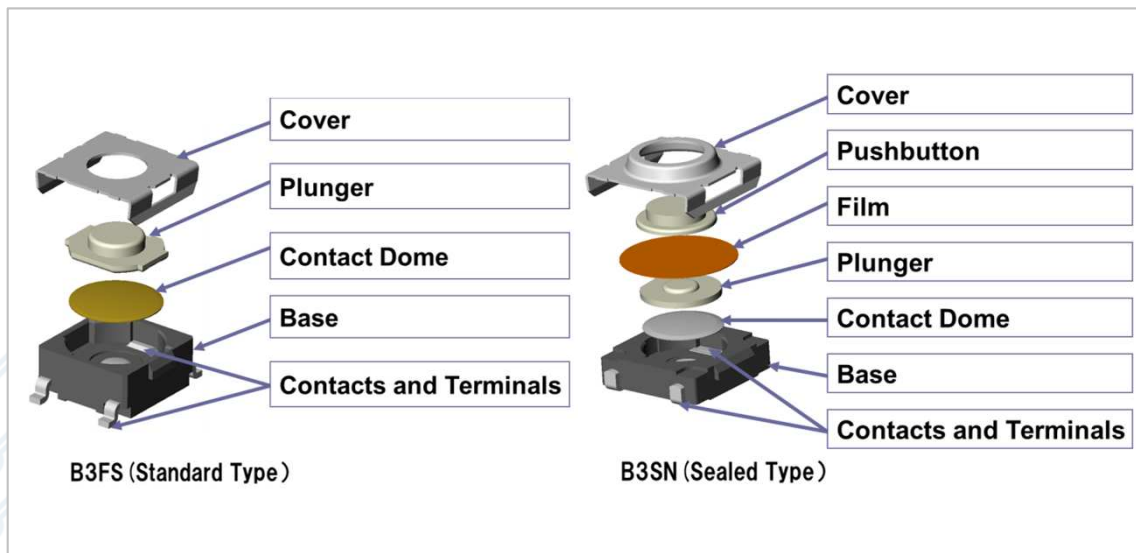


Figure 2 ● Tactile switch structure

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Product feature(2):Stable operation

Under general circumstances, switch characteristics vary across products according to the range stated in each specification. By minimizing the characteristic variance, it provides more stable switch action with less variance in characteristics between each manufactured piece process. Omron tactile switch realized this through integrated production including parts processing, assembly and inspection. All identified variation source and collected production control data of all stages of production are continuously fed back to the upstream process and controlled to ensure consistency in switch characteristics(Fig.3).

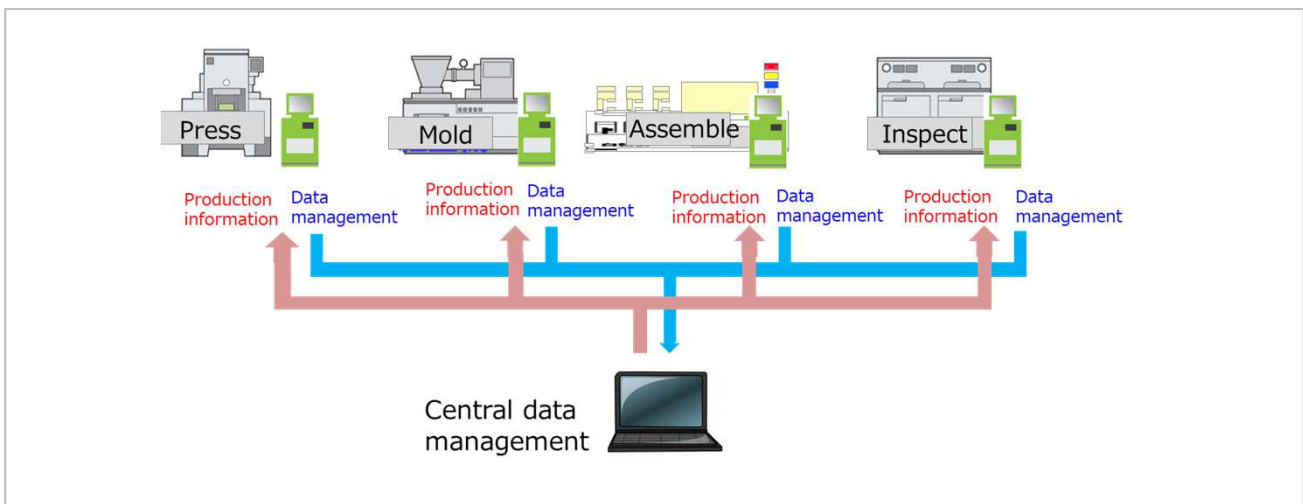


Figure 3 ● *Data feedback for tactile switch manufacturing process*

Product feature(3):Good tactile feedback

Tactile feel, for the most part, is determined by the relation of force and stroke when pressed. Tactile switch can provide the subtle difference in sensation tailored to the devices and applications users require—the right comfortable feel, the lighter feel (less stressful), a clear tactile feedback and so on. At Omron, we developed a design process that includes different parameters in conjunction with force and stroke parameters to generate optimum tactile feel and the mass-production process to incorporate the tactile feel in the switches (Fig.4).

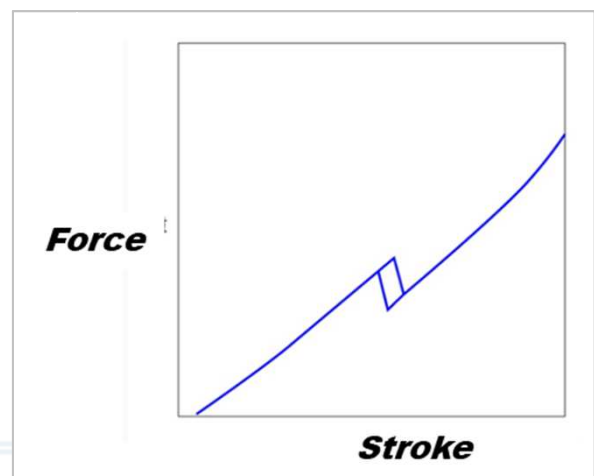


Figure 4 ● *Design of tactile feedback operation*

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Product feature(4): Customization options to meet your application needs

Omron tactile switches can be customized according to application and user needs. For example, we can work with customers to create custom tactile feel or develop custom key tops to fit into their device. This is made possible by Omron's accumulated expertise in manufacturing and switch technology.

Example of the four product features in practice (control panel for industrial equipment)

What is control panel for industrial equipment (industrial control panel)?

An industrial control panel is an input device for setting operating modes and operating condition parameters of machine tools, processing machines and equipment. The control panel is provided with many input keys to comprehensively control the operation of the overall apparatus(Fig.5).



Figure 5 ● Industrial control panel

Feature(1) Unbreakable

Mechanical switches used in control panels are required to endure longer periods of operation in order to keep maintenance work to a minimum. Omron's 12mm x 12mm B3FS-4 series tactile switch with higher force can withstand millions of cycles which is suited for systems and equipment installed at production sites.

Feature(2) Stable operation

Many mechanical switches used in control panels are preferably arranged on one side. Therefore an operator can perform the same switch operation and allow easy control hence prefer miniature tactile switches that can be controlled with small fluctuation in operating force(OF) and operating position(OP).

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Feature(3) Good tactile feedback

The switches should have the tactile feedback so that an operator will know the button has been pressed and is properly actuated even with their work gloves on. Omron tactile switch is designed with a set of force and stroke patterns to provide the right haptic feedback to the operating finger.

Feature(4) Customization options to meet your application needs

Many users want to tell apart the switches used in different locations and functional blocks inside the control panel using different surface sizes and colors of switch key tops. In addition to Omron's standard key tops offered in different sizes and colors, we do our best to accommodate your requirements by customization.

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