High Demands Placed on Function and Product Design

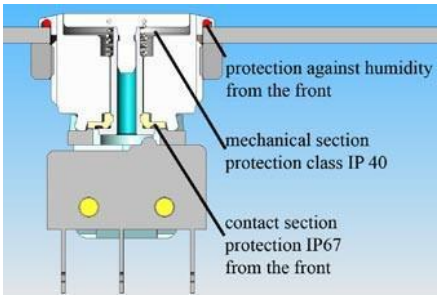
Which criteria are important when selecting an operating system for devices?

"Vandal-proof input systems" have now spread to the most diverse areas of application. These operating elements are chosen for their robust nature and, increasingly, for design reasons, too. The range of products for such input systems is just as diverse as the application areas they are deployed in.

There are piezo switches, metal switches with stroke, metal switches with tactility and switches based on sensor technology such as capacitive technology. Within this classification, a combination of the various technologies is also possible. A piezo switch may be additionally equipped with an element for tactility, for example. An overview of the various technologies as well as a description of the individual functional principles can be located at:
http://www.schurterinc.com/Components/Switches/General-Production-Information.

Choice of operating system - important factors

In order to make an appropriate choice when it comes to operating systems, all important ambient factors associated with the particular device must be taken into account.
Important factors include location, climatic requirements as well as the function to be triggered.
When it comes to considering logistics, a differentiation must be made between devices that are used exclusively inside buildings, those that are located outside but with a covering and those that are outside with total exposure to the elements. Devices which are located outside with total exposure need, in most cases, to be able to withstand snow and ice and thus minus temperatures. Under such ambient conditions it is possible for switches with stroke to temporarily fail. Water may penetrate into the space between the moving parts. When minus temperatures set in, these moving parts then freeze and the actuator can no longer be depressed for closing the contact. Piezo switches with a completely sealed surface lend themselves particularly well to meeting the demands of devices located outside with no protective covering.
When it comes to protecting the device against dust and liquids, the components are specified according to IP protection classes. Piezo switches fulfill a protection class of at least IP67. Metal switches with stroke or tactility on the other hand are designed with varying protection classes of between IP40 and IP67. In the case of metal switches, a differentiation is made between the IP protection at the mechanical level and that at the electrical contact level. This means that the electrical contact level might have a protection class of IP67, for example, whereas the mechanical level demonstrates a protection class of IP40.



Different IP Protection Classes for Switches

This differentiation is represented with the different characteristic values in the product documentation and in the relevant selector charts on the SCHURTER website. The differentiation is important when it comes to considering the mounting position or possible ambient impurities. When mounting on horizontal or slightly inclined surfaces, a hazard is posed, for example, by unintentionally spilled liquids entering the inside of the switch. If a switch is used which has the combination of protection classes described above, the functionality of the switch is initially still guaranteed after the liquid has penetrated into it. However, if the liquid is a sugar-containing substance such as lemonade or sweetened coffee, the function will become increasingly impaired. The liquid evaporates and the sugar which remains leads to the switch becoming stiff, possibly leading to jamming of the actuator. In order to avoid such impairment, a vertical mounting position should be chosen insofar as the device design permits this. Alternatively, the use of a piezo switch is recommended here, too.

Selecting the type of switch - function

The function which the switch should activate is also decisive when it comes to selecting the type of switch required. Frequently, the switches are arranged next to a display and the menu navigation is controlled via the display. An additional possibility for operator guidance is to provide the switch surface with an inscription, either using text or appropriate symbols. Each time the switch is activated, the device operator should receive feedback that the activation of the switch has been acknowledged by the machine. This feedback may be acoustic, haptic or optical. Alternatively, it may be discernible from the fact that the relevant function is triggered on the device. Optical feedback is possible by integrated illumination on the switch or by means of an appropriate display on the monitor.
In the case of self-service terminals, the information or help keys should always be provided with a switch that has high tactility. As the operator only usually activates these keys in an emergency, clear feedback that the key signal has been carried out is necessary in such a situation. The stimuli perceived via the sense of touch are most rapidly discernible by the operator.
In the case of the PM ABACUS pay machine system from the company Designa, the demands which are placed on operating elements may be seen very clearly.
The switches are produced from high-quality stainless steel and are very flat at the front of the device. This provides potential vandals with very little contact surface. An O-ring between the switch housing and the front of the device protects the inside of the device from humidity. The vertical mounting position of the switch

and the additional overhead covering prevents liquids from penetrating into the mechanical part of the switch.
The information key on the pay machines is provided with a switch that has high tactility.

Application example:
a pay machine from the company DESIGNA

Application Areas

Robust metal switches are used across the globe in various application areas, including in ticket terminals and gas stations, at information stands, in access control facilities, sanitary facilities, on public transport, in construction machinery and on control panels for industrial facilities. The application areas of the metal switches are just as diverse as the technical and design possibilities provided by the switches from the Metal Line range.

Company

SCHURTER continues to be a progressive innovator and manufacturer of electronic and electrical components worldwide. Our products ensure safe and clean supply of power, while making equipment easy to use. We offer a broad range of standard products including circuit protection, connectors, EMC products, switches and input systems, as well as electronic manufacturing services. Moreover, SCHURTER is ready to work with our customers to meet their application specific requirements, not covered in our standard range. You can rely on SCHURTER's global network of companies and partners to guarantee a high level of local service and product delivery.

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