

## PIEZOELECTRIC TECHNOLOGY - DESIGNED TO LAST

Extreme weather conditions such as ice, snow, extreme heat etc., call for extremely durable technology. Durakool Smartswitch product line was created and designed with the purpose of providing just that, a vandal resistant operation for all kinds of extreme weather conditions, and harsh industrial working environments.

A Piezo switch is a solid-state switching technology based on the functional principle of the piezoelectric crystal that utilizes the direct piezoelectric effect. Piezo switch elements typically have a piezoelectric component physically mounted on the back of a thin metal surface, the size of which is based on desired force requirements of the user.



The characteristics behind this component are such that when an action force is applied to the piezoelectric element there is a small displacement and subsequent strain on the dielectric material. This strain causes a build-up of an electric field that causes a voltage to be induced due to a charge transfer. The voltage generated is converted by the electronic connection into a polarity-neutral, electronic switch contact.

One of the main advantages of the Piezo switch is that there are no moving parts such as contacts, springs or actuator systems, resulting in fewer failures, reduced wear, and extending the life cycle. The flat actuation surface is completely sealed, preventing the intrusion of liquids or other contaminants.

The electronics within the piezo switch can also be fully potted protecting the components from the environment and making it impervious to water, oil or dirt. Having this type of design provides a sleek contemporary appearance, protection of control components, seamless, smooth and easily cleaned surface, and an enclosed system not affected by spills. Many solid-state switches are limited by activation with insulated materials such as gloves, but since piezoelectric technology is force related, piezo switches can be activated by nonconductive materials.

There is a growing trend and a number of advantages in moving toward solid state switching devices such as Piezo. Although many other technologies work well for their intended applications, piezoelectric technology offers engineers and designers nearly unlimited flexibility when challenged with switch actuation and design.

### PIEZO SWITCHES

Durakool's Smartswitch Piezo switches line, offers advanced technology in a high finish. Durakool switches can be used in outdoor machines like fuel pumps, car wash stations, weighing stations etc., where they are exposed to harsh weather conditions. In applications where there is no need for machine status indication, Durakool's non-illuminated range is advisable. Ring or dot illuminated switches, provides an advanced user interface in the form of visual operation-feedback or switch mode indication, and are advisable for more advanced applications.

### BASIC PIEZO SWITCHES



The basic piezo switches family represents a range of switches operated by touch. The action force on the Piezo disk causes a voltage to be induced due to a charge transfer. The voltage generated is converted by the electronic connection into a polarity-neutral, electronic switch contact.

## PROGRAMABLE PIEZO SWITCHES



The programmable Piezo switches family represents a range of switches operated by touch and featuring various time-delay and automatic activation functions. Based on the basic Piezo switch, the programmable Piezo switch is an integral solution for any practical switch activation market.

### FEATURES:

- Extremely long lifetime
- Operating cycles: >10 million
- Maximum sealing and dirt protection
- Easy activation by soft touch
- Vandal proof - one piece – no moving parts
- Various connectors available
- RoHS compliant

### AVAILABLE IN THE FOLLOWING COLOURS:



## PIEZO KEYPADS

Durakool's Smartswitch Piezo keypad is a one piece construction allowing maximum durability. It is designed and manufactured to be used in rough outdoor environments and can withstand extreme weather conditions. With a flat surface and with no moving parts, Durakool's Smartswitch keypad is ideal for versatile access control solutions, fuel pumps etc.

The Smartswitch keypad is a one piece construction, to which individual switching units are added. It is then potted at the back of the panel, and is anodized printed. As a result, it has a perfect seal against water, can withstand harsh weather conditions, and is vandal resistant.

### FEATURES:

The Smartswitch keypad can be customized according to customer needs:

|                      |               |          |                 |                |
|----------------------|---------------|----------|-----------------|----------------|
| <b>Material</b>      | Brass         | Aluminum | Stainless steel |                |
| <b>Finish</b>        | Chrome/nickel | Satin    | Stainless steel | Anodized color |
| <b>Connector</b>     | JCT           | KCC      | Open wires      | Other          |
| <b>Configuration</b> | 3X4           | 4X4      | Customized      |                |

## PIEZO KEYBOARDS

Durakool's Smartswitch Piezo keyboard is a one piece construction allowing maximum durability. It is designed and manufactured to be used in rough outdoor environments and can withstand extreme weather conditions. With a flat surface and with no moving parts, Durakool's Smartswitch keyboard is ideal as an integral part of operators panels across numerous industries, such as food processing conveyer, fuel management systems, mining equipment etc.

The Smartswitch keypad is a one piece construction, to which individual switching units are added. It is then potted at the back of the panel, and is anodized printed. As a result, it has a perfect seal against water, can withstand harsh weather conditions, and is vandal resistant.

## FEATURES:

The Smartswitch keyboard can be customized according to customer needs:

|                      |               |          |                 |                |
|----------------------|---------------|----------|-----------------|----------------|
| <b>Material</b>      | Brass         | Aluminum | Stainless steel |                |
| <b>Finish</b>        | Chrome/nickel | Satin    | Stainless steel | Anodized color |
| <b>Connector</b>     | JCT           | KCC      | Open wires      | Other          |
| <b>Configuration</b> | 3X4           | 4X4      | Customized      |                |

## CUSTOMIZED – TECHNOLOGY DESIGNED FOR YOUR NEEDS

Durakool SmartSwitch products line offers basic Piezo switches along with programmable piezo switches which are developed and manufactured in house and can be customized to meet specific needs. Either product functionality or design can be customized to include:

### Surface and Material

Durakool switches are available in various housing materials like Stainless steel, Aluminum and Brass. The surface and material can be set according to customer requirements, and specific fields of application. For external applications, resistant materials such as stainless steel or aluminum are recommended.

### Color Design

The surfaces of the switch can be finished according to customer requirements. For example, the aluminum housing of the switch can be delivered as natural anodized or in various anodized colors.

### Shapes and Sizes

A wide variety of shapes and sizes for a broad range of solutions can be offered. The size of the switch surface is variable up to a diameter of 30 mm. Piezo switches with a specific mounting diameter can be adapted in shape and size to customer requirements. Adaptations for integration into individual layouts are also available.

### Lettering and Marking

Depending on the application, there are various lettering and marking possibilities. Switches of this type can be laser-lettered or marked. For special applications, the lettering or marking can also be etched or engraved with a colored background.

### Lighting and Illumination

Durakool offers the colors Red, Green and Blue for point illumination of the switches. Point illuminations in other colors are available on request.

The ring illumination design is uniform and available in the following colors:

### AVAILABLE IN THE FOLLOWING COLOURS:



Ring illumination is available upon request up to 3 colors in one switch.

### Terminals and Connectors

Depending on the design, Durakool switches are available with quick connect terminals or flexible wires. Switches with plug-compatible adapters are available upon request. Contact Durakool today and let our experienced team design a unique piezo product for your specific application.