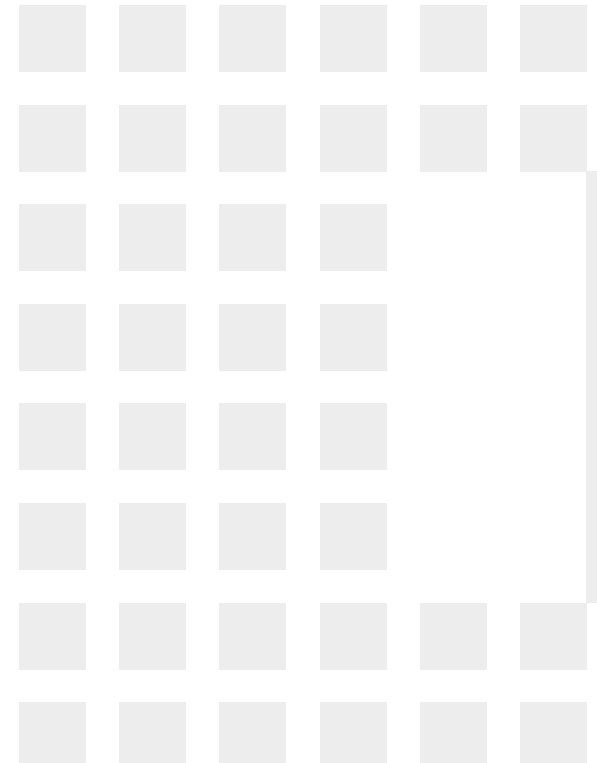




Think Automation and beyond...

IDEC Piezo Switches



- What is “*PIEZO*”
- Product Line-up & Features
- Target Applications

Definition

A piezo switch is an electrical switch based on piezoelectricity effect. Piezoelectricity is the electric charge that accumulates in certain solid materials (e.g. crystals, ceramics) in response to applied mechanical stress.

The word *piezoelectricity* comes from Greek and means electricity resulting from pressure.

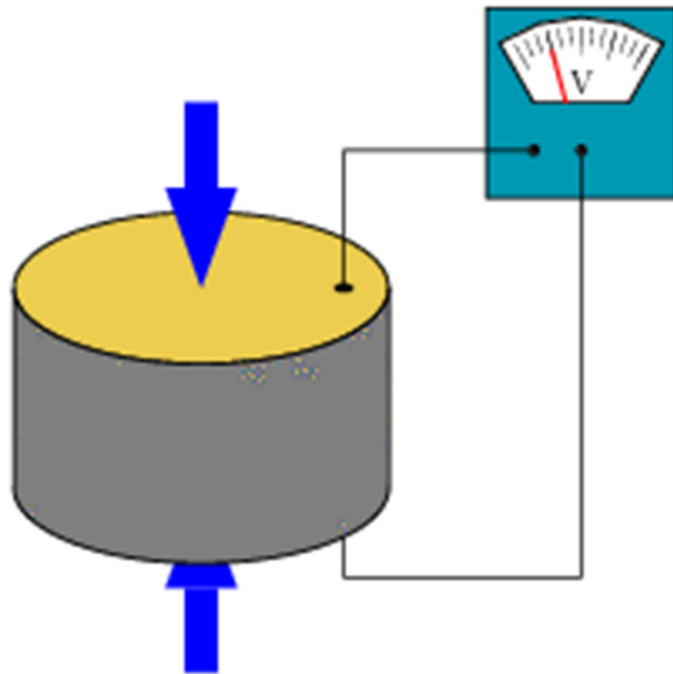
Piezo switches are devices that generate only one pulse per pressure, even if pressed down for a long period of time.

Unlike conventional electromechanical switches, piezo switches have no moving parts which makes them extremely durable over time as no wear is involved.



Piezo switches

How it works

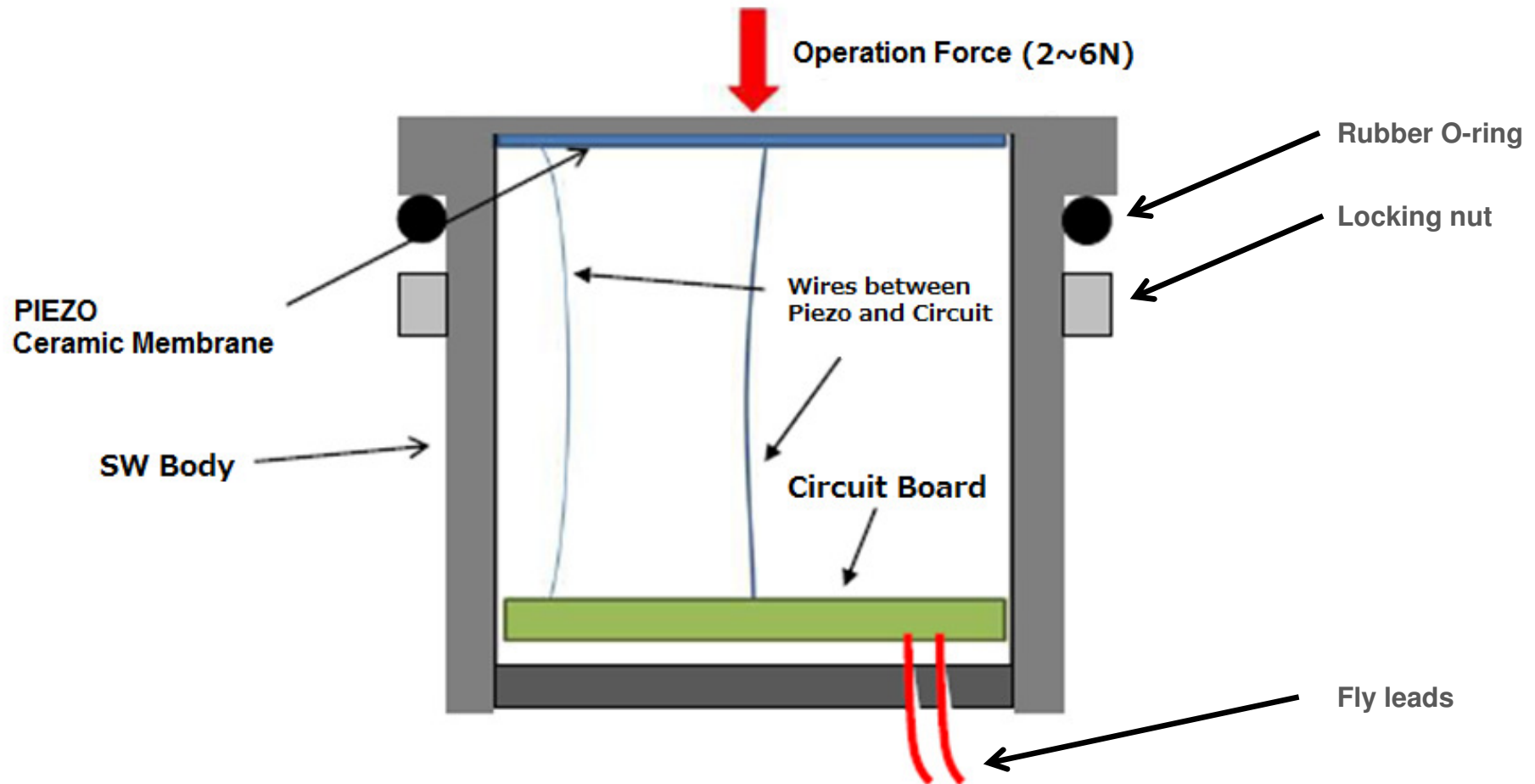


Picture Source: Wikipedia

In a piezo switch, a force applied to the switch surface transfers to the piezo disk, creating an electrical pulse. This electrical signal is converted to an expected electrical output through a customisable electronic circuit. The duration of the electrical signal depends on the speed, force and duration of the actuation force. The output of the switch is closed for a specified pulse duration, depending on the electrical function chosen (see next page).

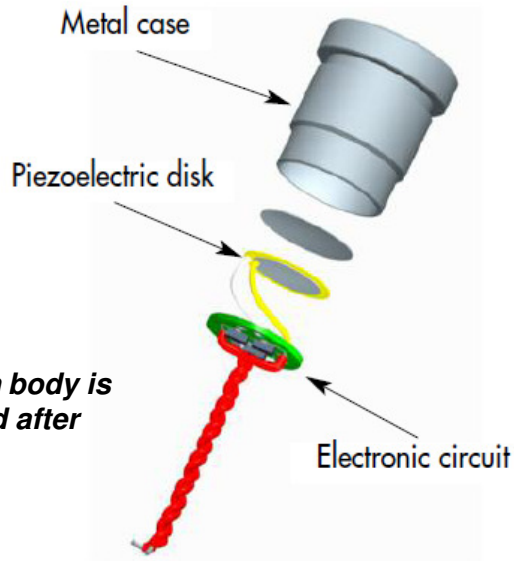
Piezo switches

How it works – Structure



When the operator pushes the actuator on the top of the switch, the Piezo membrane deforms and generates current / voltage. This generated current / voltage is supplied to the circuit board inside and makes the contact open and close.

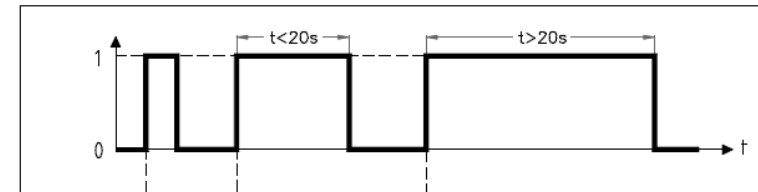
IDEC Piezo Switches – Structure



In an IDEC PW1L/PN1L series switch, a piezo element is adhered inside of a machined metal housing, just .015 inches (1/64th) from the top surface of the housing (switch body). The action of force on the switch body deflects the piezo disk causing an electrical pulse from the piezo element. This pulse is converted to a switch function by IDEC's proprietary electronics within the switch body.

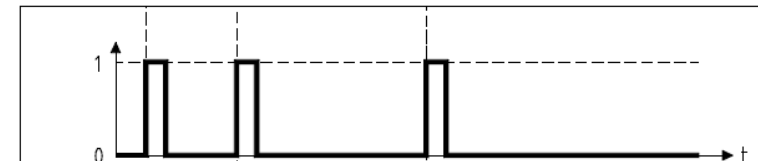
FINGER PRESSURE
applied to switch

1 = pressure
0 = no pressure

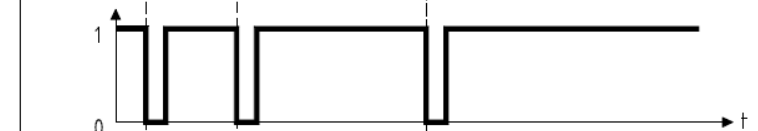


OUTPUT

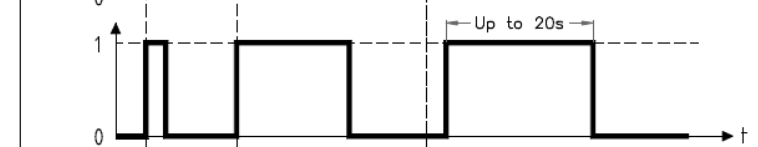
- Momentary NO (pulse)



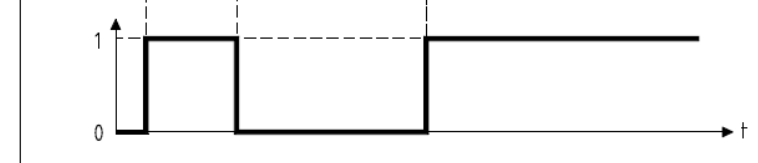
- Momentary NC (pulse)



- Momentary NO
prolongated pulse



- Latching (ON - OFF)
Requires external power supply

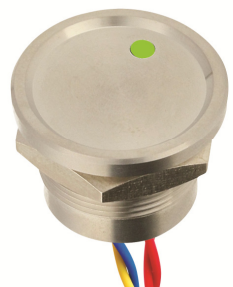


Note:

Although the duration of the switching function can be customized within IDEC's electronic design, standard 1NO output configuration is initially offered.

- What is “*PIEZO*”
- Product Line-up & Features
- Target Applications

PW1L/PN1L Piezo Switch Series Overview



PW1L-R6A

22mm Piezo with finger location bezel
12VDC PW1L-R6AFB002P(0B/0G/0S/0Y/0W/SG)
24VDC PW1L-R6AFB002J(0B/0G/0S/0Y/0W/SG)



PW1L-RYA

22mm Piezo with chamfer bezel
12VDC PW1L-RYAFB002D(0B/0G/0S/0Y/0W/2A)
24VDC PW1L-RYAFB002E(0B/0G/0S/0Y/0W/2A)



PN1L-M2A

30mm Piezo with translucent ring
12VDC PN1L-M2AFB002D(0B/0G/0S/0Y/0W/2A)
24VDC PN1L-M2AFB002E(0B/0G/0S/0Y/0W/2A)



PN1L-M4A

30mm Piezo with side-viewable translucent ring
12VDC PN1L-M4AFB002D(0B/0G/0S/0Y/0W/2A)
24VDC PN1L-M4AFB002E(0B/0G/0S/0Y/0W/2A)

Colors Available:

- ✓ Blue (B)
- ✓ Green (G)
- ✓ Red (S)
- ✓ Yellow (Y)
- ✓ White (W)
- ✓ Red/Green (2A)
- ✓ Red/Green (SG)*
*dot only

Piezo switches – Features

Distinctive features

- Available in 22mm and 30mm
- Solid state with no moving parts
- LED illumination (no mechanical/tactile feedback)
- Sealed to IP68 (submersible) and IP69K
- Long life expectancy: 50 million cycles
- Operating temperature: -40 °C to + 75 °C
- Maximum ratings: 24V DC, 1A
- Smooth and easy to clean metal surface
- Short unibody 316L stainless steel construction
- Robust and vandal resistant



Illumination ring is translucent/off-white when off



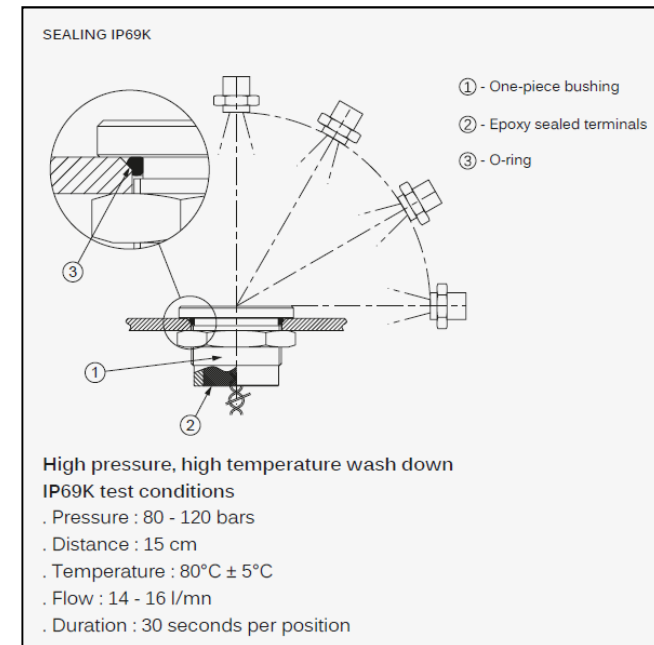
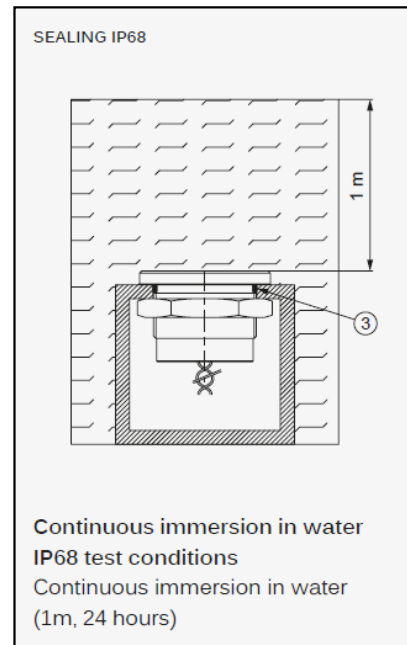
Piezo Switch Advantages

High reliability

- 50 millions cycles - The IDEC piezo switches are virtually solid-state allowing for a very long life expectancy.
- The flat top surface eliminates retention areas found in conventional pushbutton switches facilitating efficient cleaning – perfect for medical and food-processing industries.
- A high performance sealing (IP68 and IP69K) is achieved due to the one-piece construction of the switch.
- The screw-machined metal housing construction and IDEC's vertical integration allow for the manufacturing of unique shapes.

Fully sealed

- IP68 submersible
- IP69K high pressure high temperature power spray



Piezo switches – Unique Value Prop

- No moving parts
 - rugged, sealed, tamper and vandal proof solid state constructions
 - 50 million cycles of life expectancy
 - one continuous piece instead of a two piece assembly of threaded tube stock and a cap or snap-on components
- IP69K rated
 - Waterproof; high-pressure / high-temperature spray resistant
 - Underwater switches to withstand the pressure or to be submerged up to 1m
- 316L stainless steel
 - Corrosion resistant to caustic wash-down solutions
- Smooth, Crevice-free Surface
 - Easier to clean
 - Minimizes areas on the button in which contaminants can potentially be lodged.
- -40°C to +75°C
 - The most extreme environment.

- What is “*PIEZO*”
- Product Line-up & Features
- Target Applications

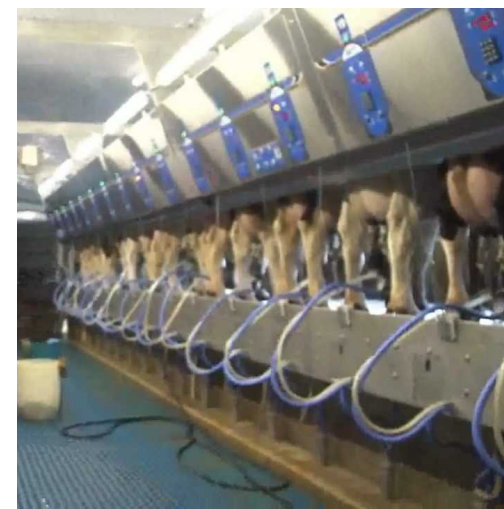
Primarily Applications



Food Processing



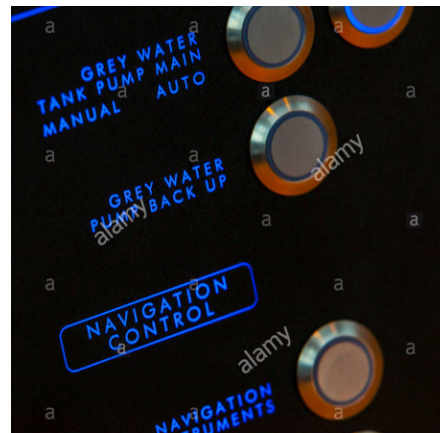
Spa



Dairy



Beverage



Yacht



Commercial Kitchen

Primarily Applications

- **Food Processing** – Tomato/fruit/seafood/meat processing facilities that need CIP (Clean In Place) requirements.
- **Commercial Kitchen Appliances** – Sanitizable switches, oven control, beverage, dish washing equipment, lift/transportation systems.
- **Spa & Marine** – Submerge & Corrosion resistant
- **Chemical Plants** – operation controller for petroleum machinery.

Secondary Applications

- **Hospital / Medical** – Access controls, intercom/call system controls that require frequent sterilization
- **Bio/Lab Equipment** – For use in controlled environments and sterile clean rooms.
- **Public Area** – susceptible to vandal or high traffic, such as parking pay stations
- **Emergency Call Box** – in vandal prone areas, typically mass transportation systems or college campuses.
- **Heavy Ware & Tear** – Other applications involving extraordinary ware and tear, such as a door opener on subway

Thank You!!