

ACTIVE METAL ^{TEXZEC}

ULTRA-INTELLIGENT, ULTRA-RUGGED
TOUCH SENSORS

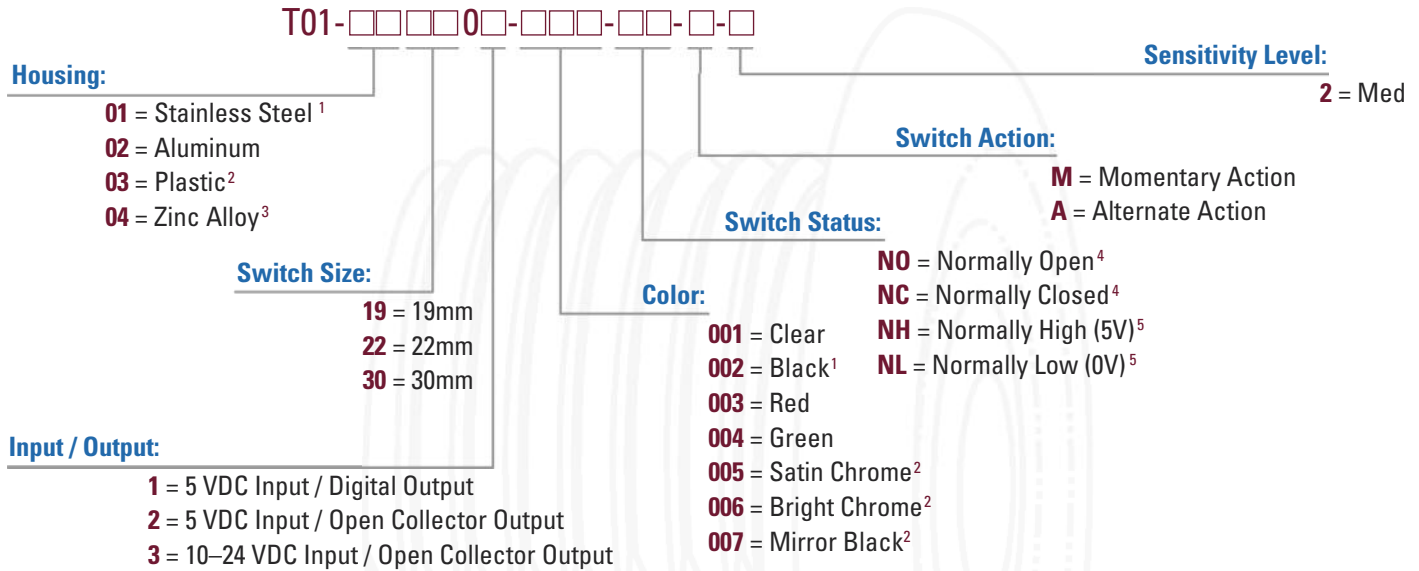


512.341.7700
www.ActiveMetal.com

ORDERING INFORMATION

The ActiveMetal product line has many configurable options and over 600 part numbers. Please use the Matrix below and the Specifications pages that follow to configure the ActiveMetal product that is right for your application. Not all options and configurations are possible, please contact an authorized distributor or the factory for help configuring your part.

PART NUMBER MATRIX



¹ Stainless Steel housings are available only in the 22mm or 30mm sizes.

² Plastic housings are available in the 22mm size (Black 002) only.

³ Diecast Zinc Alloy housings are available in 22mm size and Chrome colors (005, 006, 007) only.

⁴ Normally Open or Normally Closed can only be used with Open Collector Output.

⁵ Normally High or Normally Low can only be used with Digital Output.

INPUT / OUTPUT:

- **5VDC Input / Digital Output** — 5VDC Input (red wire) and Digital Output (green wire) is output either at 5V or 0V level relative to input voltage supply's ground (black wire).
- **5VDC Input / Open Collector Output** — 5VDC Input (red wire) and Open Collector Output (green wire) is output that is open or closed relative to input voltage supply's ground (black wire).
- **10 – 24VDC Input / Open Collector Output** — Will work with any input operating voltage between 10 – 24VDC (red wire) and Open Collector Output (green wire) is output that is open or closed relative to input voltage supply's ground (black wire).

SWITCH ACTION:

- **Momentary Action** — Output reverts to its previous status as the switch is released.
- **Alternate Action** — Output changes to its opposite status and latches as a result of the switch activation.

SWITCH STATUS:

- **Normally Open** — An unactivated condition, output is open relative to input voltage supply's ground (sinking output).
- **Normally Closed** — An unactivated condition, output is closed relative to input voltage supply's ground (sinking output).
- **Normally High, 5V** — An unactivated condition, output at 5V level relative to input voltage supply's ground.
- **Normally Low, 0V** — An unactivated condition, output at 0V level relative to input voltage supply's ground.

SWITCH SENSITIVITY LEVELS:

- **Level 2** — Designed for indoor / outdoor use with or without a gloved hand; impervious to false activations caused by water.

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Design and specifications subject to change without notice due to continuing product improvements

Contact an Authorized Distributor or Factory for Pricing

HOW ACTIVE METAL WORKS

Step 2

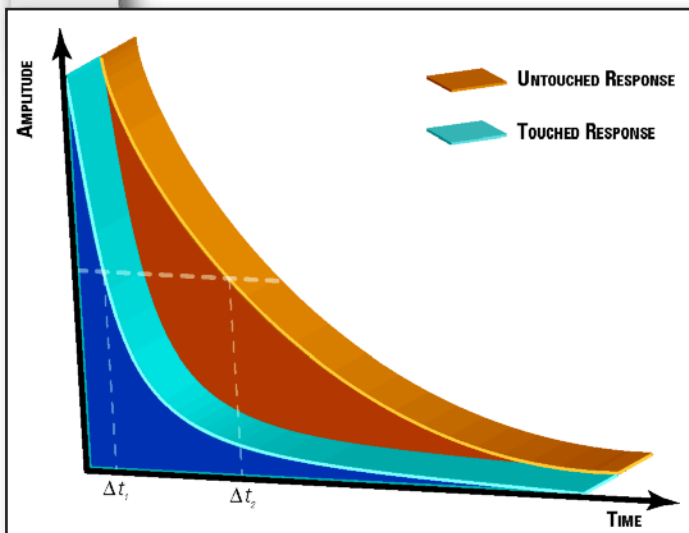
The basic principle is that a material capable of supporting shear and torsional mechanical waves at ultrasonic frequencies can have those waves trapped or localized by contouring its surface. These trapped energy regions are set into motion with transducers and act as high quality resonators.



ActiveMetal Products

Step 1

When the time to a threshold value is lower than the preset value, the microcontroller is programmed to indicate switch actuation. This is a continuous process occurring every few milliseconds.



The decay rate has changed. Actuation is triggered

INTELLIGENCE & COMMUNICATIONS

Our engineers will work with you to tailor and apply our firmware so that it produces the sensor that's right for your application. Whether you require features like a specific communication protocol (**RS232, USB, CAN Bus, etc.**), error reporting, pressure sensitivity, networking capabilities, or variable output, ActiveMetal sensors with their programmable functions can be designed to meet your every need. In addition, the firmware is also capable of **self-adaptation** and **self-diagnostics** which is especially useful in mission critical applications.

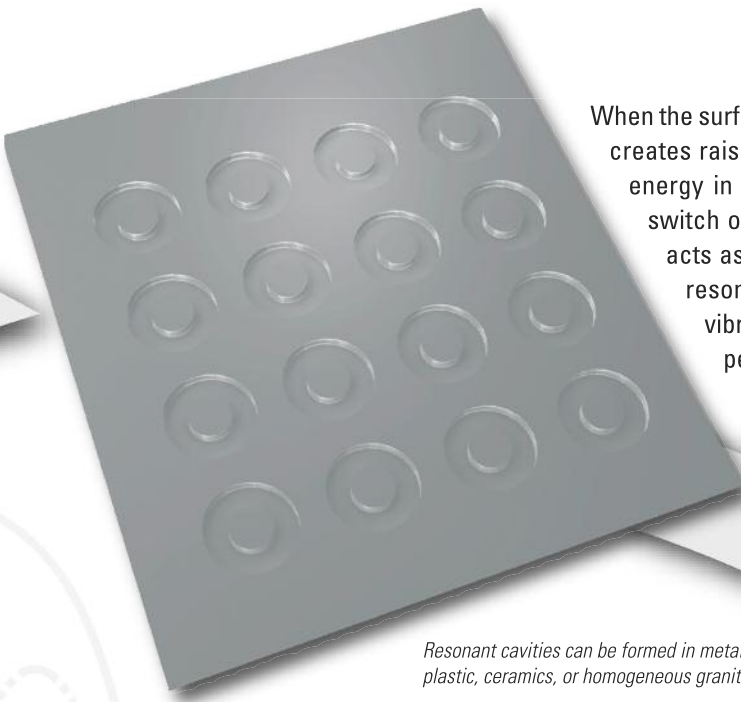
The **self-adaptation** feature will determine after repeated monitoring and averaging of the ultrasonic signals if they need to be adjusted to account for damage, temperature or foreign material interference within the active switch area. This automatic process repeats continuously without user intervention and ensures continual operation.

Step 5

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When the surface of a switch plate is contoured as depicted here, it creates raised regions or Resonant Cavities that trap ultrasonic energy in a defined area or column within the material. The switch operates with ultrasonic energy, and the metal plate acts as a very effective shield. Despite the use of acoustic resonance, vibration in these sensors and mechanical vibrations from external sources do not influence sensor performance.



Resonant cavities can be formed in metal, plastic, ceramics, or homogeneous granite

CAPABILITIES

The **self-diagnosing** feature can sense their own abnormal operation or predict an imminent failure and notify the user. Or with the use of multiplexers the switch can be programmed to transfer the actuation area to a backup switch location, completely disabling the abnormal switch.

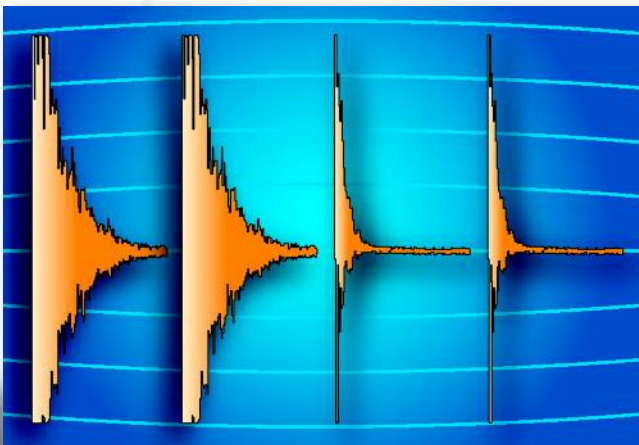
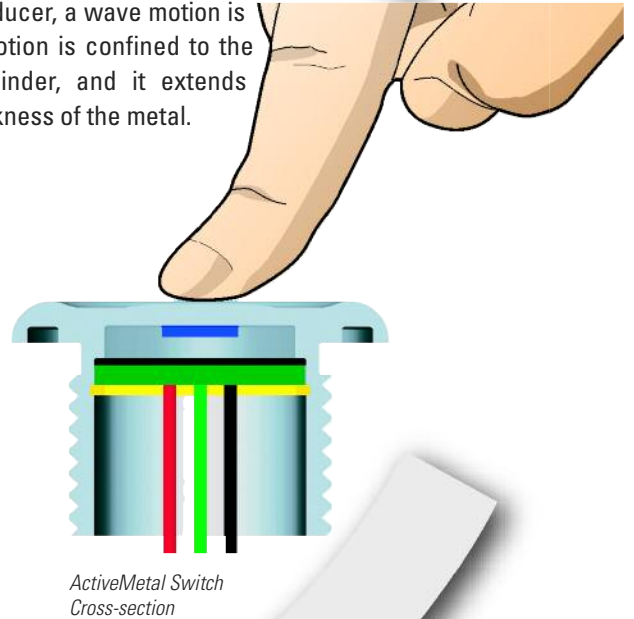
When a resonator is set into vibration in the MHz range by a properly positioned ultrasonic transducer, a wave motion is induced. The motion is confined to the shape of a cylinder, and it extends through the thickness of the metal.

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Motion is initiated by an electrical impulse to the transducer, then the vibration decays or "rings down", like a bell that has been struck. A finger or gloved hand touching the front surface of the resonant cavity dampens the vibration and reduces the region's ring-down time. This reduction in ring-down time (decay rate) is detected with a microcontroller which can be multiplexed for multiple switch positions.

Step 3



*Resonant ring-down reduction waveform —
Dampened ring-down reduction waveform*

Step 4

SPECIFICATIONS

MECHANICAL SPECIFICATIONS

- Maximum Actuation Force:
Level 2 Sensitivity: < 5 lbs. (22.2 N) ADA Compliant
- Mechanism: 100% Solid-state, No Moving Parts
- Operational Life: +20MM cycles, -40°C to 85°C (Typ)

19MM MECHANICAL SPECIFICATIONS

- Materials: Aluminum (6061) with Type II Anodization

22MM MECHANICAL SPECIFICATIONS

- Materials: Stainless Steel (316),
Aluminum (6061) with Type II Anodization
Plastic (PPS)
Zinc Alloy (Die Cast)

30MM MECHANICAL SPECIFICATIONS

- Materials: Stainless Steel (316),
Aluminum (6061) with Type II Anodization

ENVIRONMENTAL SPECIFICATIONS

- Operating Temperature Range: -40° C to +85° C (Typ)
- Storage Temperature Range: -55° C to +125° C (Typ)
- Relative Humidity: No Effect
- Ingress Protection: IP68 (submerged in 1 m without a panel for 96 hours)
- Shock: Tested to 30g in each Axis
(drop test from 20 ft to concrete)
- Vibration: Tested at 4 hours each Axis
(actuated during vibration)
- Impact: 2 ft-lb impact from 1.7ft (per UL 294)



ELECTRICAL SPECIFICATIONS

- Current Handling: 100mA (Max)
- Current Draw: < 5mA
- ESD: Meets IEC 61000-4-2 spec to Level 4 Immunity
- Contact Resistance: None
- Contact Bounce: None

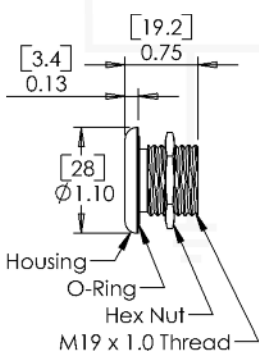
19MM, 22MM, 30MM ELECTRICAL SPECIFICATIONS

- Voltage: +5 VDC ± 5%, or
+10–24 VDC
- Wire Leads: 24 AWG,
12" long,
105C Insulation

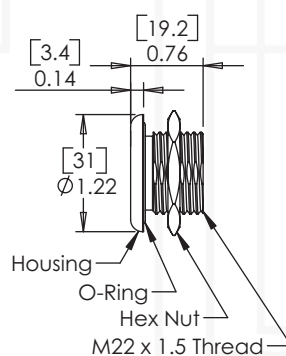
FUNCTIONAL OPERATION SPECIFICATIONS

- Momentary / Alternate
- Normally Open / Normally Closed
(Open Collector Output)
- Normally High, 5V / Normally Low, 0V (Digital Output)
- Make / Break via Transistor

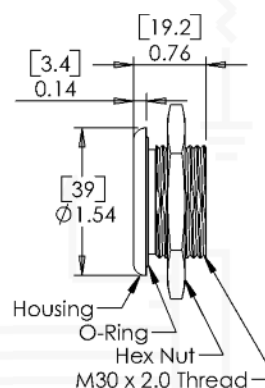
19MM SWITCH



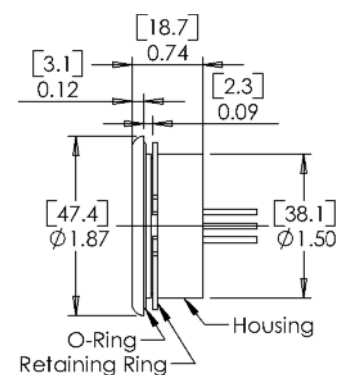
22MM SWITCH



30MM SWITCH



38MM SWITCH



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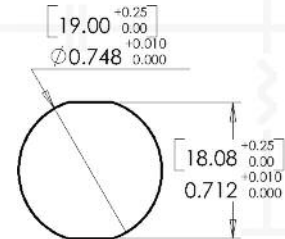
MOUNTING INSTRUCTIONS

The ActiveMetal products featured here are designed to be panel mounted. The 19mm, 22mm and 30mm are threaded and have two D-flats to prevent rotation, each is supplied with an O-ring and mounting nut for installation.

19MM MOUNTING SPECIFICATIONS

- Mounting Panel Thickness: 0.0625" (1.58mm) to 0.500" (12.7mm)
- Mounting Panel Thickness with oriented Double "D" Flats: 0.090" (2.3mm) to 0.500" (12.7mm)
- Mounting: Brass Nut (15 Inch Pounds — Max), AS568A-019 Butyl Rubber O-ring

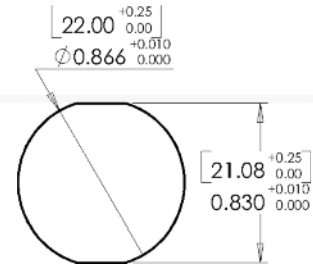
19MM PANEL CUTOUTS:



22MM MOUNTING SPECIFICATIONS

- Mounting Panel Thickness: 0.050" (1.27mm) to 0.500" (12.7mm)
- Mounting Panel Thickness with oriented Double "D" Flats: 0.090" (2.3mm) to 0.500" (12.7mm)
- Mounting: Brass Nut (15 Inch Pounds — Max), AS568A-019 Butyl Rubber O-ring

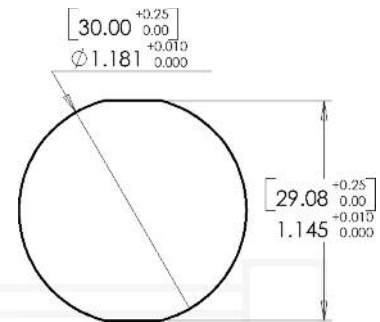
22MM PANEL CUTOUTS:



30MM MOUNTING SPECIFICATIONS

- Mounting Panel Thickness: 0.0312" (0.97mm) to 0.469" (11.9mm)
- Mounting Panel Thickness with oriented Double "D" Flats: 0.090" (2.3mm) to 0.469" (11.9mm)
- Mounting: Brass Nut (15 Inch Pounds — Max), AS568A-019 Butyl Rubber O-ring

30MM PANEL CUTOUTS:



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