

## MICRO SWITCH™ Magnetically Held Toggle Switches

ET Series

005433

Issue 1

Datasheet



### DESCRIPTION

MICRO SWITCH™ ET Series toggle switches are a specialty type of toggle switch with an electrical latching mechanism. The latching mechanism (internal solenoid in the switch) is designed to hold the momentary switch contacts closed once the toggle switch has been manually actuated. An auxiliary set or remote set of contacts opens the solenoid circuit of the switch and releases the toggle lever mechanism while opening the switch contacts which were held closed.

To fulfill a variety of applications, the ET toggle switches are available with up to four poles, with two or three toggle lever positions, with or without lever locks. Most ET Series toggle switches mount in the popular size 15/32 inch diameter hole. ET toggle switches are designed to the military standards of SAE AS55941 with many of the switches being military qualified.

### VALUE TO CUSTOMERS

- Switch design allows a remote disconnect of the magnetically held switch contacts

### DIFFERENTIATION

- Sole manufacturing source for magnetically held toggle switches

### FEATURES

- Most ET switches are designed and qualified to SAE AS55941 military standards to meet the required military or commercial aircraft requirements
- Uniquely designed with an integral solenoid which provides electrically maintained switch contacts (magnetic latching) for circuit requirements
- The solenoid can be over-riden with manual movement of the toggle lever where immediate release is required
- Four different styles of lever actuators and three different types of electrical termination
- Temperature range of -65 °C to 71 °C [-85 °F to 160 °F] to accommodate applications in controlled and uncontrolled temperature environments
- Catalog listings available with up to four poles for control of multiple circuits or providing redundant circuit capability

### POTENTIAL APPLICATIONS

- Flight decks for commercial and military aircraft
- Flight decks for commercial and military helicopters

### PORTFOLIO

In addition to the ET Series, Honeywell offers six series of MICRO SWITCH™ toggle switches including the [TL Series](#), [NT Series](#), [TS Series](#), [TW Series](#), and [AT Series](#).

# MICRO SWITCH™ Magnetically Held Toggle Switches, ET Series

Table 1. Specifications

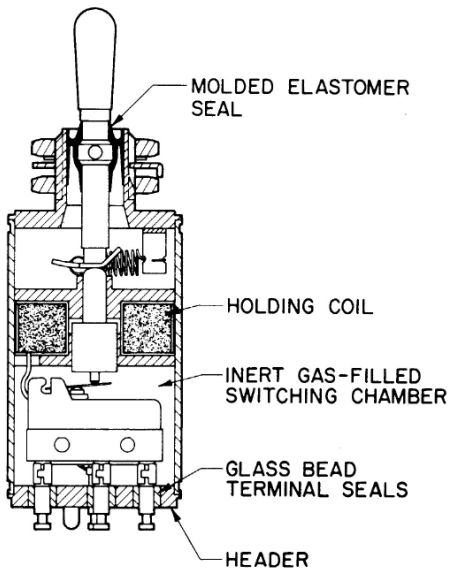
| Characteristic                 | Parameter   |
|--------------------------------|---|
| Description                    | Military-grade toggle switch with magnetic “hold” capabilities  |
| Sealing                        | Sealed to SAE AS55941 specifications  |
| Operating temperature          | -65 °C to 71 °C [-85 °F to 160 °F]  |
| Lever actuator styles (metal)  | Standard lever, tab lever, pull-to-unlock lever, push-to-unlock lever   |
| Lever/switch action            | 2 or 3 positions; maintained or mechanical momentary with electrically maintained (solenoid energized) feature                                  |
| Mounting                       | Ø 15/32 in [Ø 0.47 in]  |
| Circuitry                      | 1PDT, 2PDT, 4PST, 4PDT  |
| Termination                    | Leadwire, solder, screw   |
| Contact material               | Fine silver   |
| Electrical rating @ 28 Vdc     | Up to 7 A (refer to Table 2, Electrical Ratings)  |
| Approvals                      | Most catalog listings qualified to SAE AS55941  |
| Dimensions with standard lever | 90,6 mm H (with screw termination) x Ø 25,4 mm [3.57 in H x Ø 1.00 in]; Refer to individual drawings for above panel and below panel dimensions |

Table 2. Electrical Ratings (Amps)

| Rating Code | Supply Voltage | Sea Level |           |       | 65,000 ft      |                  |       |
|-------------|----------------|-----------|-----------|-------|----------------|------------------|-------|
|             |                | Resistive | Inductive | Motor | Resistive      | Inductive        | Motor |
| A           | 28 Vdc         | 4         | 2.5       | 4     | 4              | 2                | 4     |
| B           | 28 Vdc         | 4         | 3         | 4     | 4              | 2.5              | 4     |
| C           | 28 Vdc         | 7         | 2         | –     | 5              | 1.5              | –     |
| D           | 28 Vdc         | 7         | 4         | –     | 7 <sup>1</sup> | 2.5 <sup>1</sup> | –     |

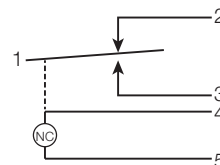
<sup>1</sup> 50,000 ft for Rating Code D.

## TYPICAL ET SWITCH CONSTRUCTION

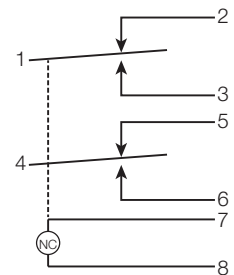


## CIRCUITRY

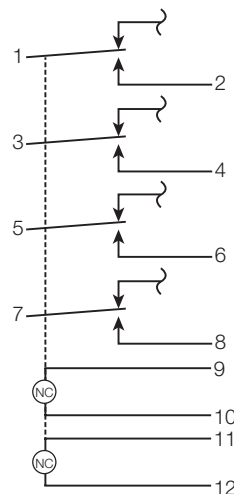
Single-Pole Double-Throw



Double-Pole Double-Throw



Four-Pole Single-Throw

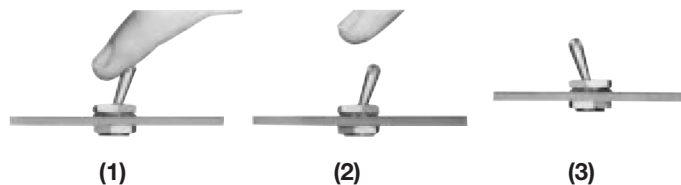


# MICRO SWITCH™ Magnetically Held Toggle Switches, ET Series

## PRINCIPLE OF OPERATION

A holding coil in ET toggle switches replaces mechanical holding mechanisms to maintain the toggle in an operate position. The toggle is released by breaking the coil circuit.

When the hold-in-coil circuit is open, the ET functions as a momentary contact switch. When the coil is energized (through remote contacts), the toggle lever will be held (maintained) in the operate position. De-energizing the coil causes the lever to snap back to the unoperated position. The lever can also be released manually (overridden). The solenoid has a hold-in capacity only. Energizing the coil circuit will not pull the toggle lever into an operated position from an unoperated position.

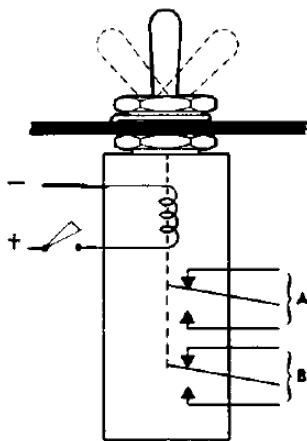


### Two-Position

The illustration above shows the operating sequence for an ET with one SPDT circuit. (1) circuit closed manually; (2) energized solenoid holds switch circuit closed; and (3) remote contact breaks solenoid circuit, releases the toggle, and opens the switch circuit. In ETs with two SPDT circuits, both circuits transfer when the lever is operated.

### Three-Position

ETs with two SPDT circuits have a magnetic hold-in capability in both directions from center. When the lever is in the center position, the circuitry is as shown in the illustration below. When the lever is moved to one extreme position, switch (A) circuit is transferred and switch (B) circuit is unchanged. In the other extreme position, switch (B) circuit is transferred while switch (A) circuit is unchanged.



## TOGGLE TYPES

**Standard** — Tapered matte finish stainless steel.

**Pull-to-unlock** — Prevents accidental actuation; must be pulled out to change positions. Stainless steel and nickel-plated brass.

**Push-to-unlock** — Guards against accidental operation. The toggle must be depressed approximately .100 inch before it can be moved to either extreme position. Matte-finish stainless steel.

**Tab** — Paddle-shaped clear anodized aluminum tab.



## TERMINAL TYPES

**Turret** — Plated for easy solder connection of up to #14 wire.

**Leadwire** — No. 20 wire per MIL-W-5086, marked per MIL-W-5088. Standard length of six feet. Leadwire ends are stripped. Other material and lengths can be furnished.

**Screw** — 4-48 UNF x 0.188 (ref.) (long round head screws with lockwashers). Separated by molded phenolic barriers.



# MICRO SWITCH™ Magnetically Held Toggle Switches, ET Series

## TWO-POSITION ORDER GUIDE

Table 3. Two-Position ET Series

| No. of Poles/<br>Basic Switches | Circuit Made With Toggle Lever At: |                 | Lever Type     | Termination          | Catalog Listing   | Military Number  | Electrical Rating Code | Housing Height (Dimension A) mm [in] <sup>1</sup> |
|---------------------------------|------------------------------------|-----------------|----------------|----------------------|-------------------|------------------|------------------------|---|
|                                 | Keyway*                            | Opposite Keyway |                |                      |                   |                  |                        |   |
| 1                               | 1-3                                | 1-2             | Standard       | Leadwire (side exit) | <b>25ET61-6</b>   | <b>M5594/1-1</b> | B                      | 51,6 [2.03]                                       |
| 1                               | 1-3                                | 1-2             | Standard       | Screw                | <b>25ET61-S</b>   | <b>M5594/1-3</b> | B                      | 61,2 [2.41]                                       |
| 1                               | 1-3                                | 1-2             | Standard       | Solder Turrent       | <b>25ET61-T</b>   | <b>M5594/1-2</b> | B                      | 47,5 [1.87]                                       |
| 1                               | 1-3                                | 1-2             | Tab Lever      | Leadwire (side exit) | <b>25ET62-6</b>   | <b>M5594/1-4</b> | B                      | 51,6 [2.03]                                       |
| 1                               | 1-3                                | 1-2             | Pull-to-unlock | Leadwire (side exit) | <b>25ET63-6-F</b> | -                | B                      | 51,6 [2.03]                                       |
| 1                               | 1-3                                | 1-2             | Standard       | Leadwire (side exit) | <b>25ET64-6</b>   | <b>M5594/1-6</b> | B                      | 51,6 [2.03]                                       |
| 2                               | 1-3, 4-6                           | 1-2, 4-5        | Standard       | Solder Turrent       | <b>26ET61-T</b>   | <b>M5594/2-1</b> | A                      | 47,5 [1.87]                                       |
| 2                               | 1-3, 4-6                           | 1-2, 4-5        | Pull-to-unlock | Solder Turrent       | <b>26ET61-T-F</b> | -                | A                      | 47,5 [1.87]                                       |
| 2                               | 1-3, 4-6                           | 1-2, 4-5        | Standard       | Solder Turrent       | <b>26ET65-T</b>   | <b>M5594/2-2</b> | A                      | 47,5 [1.87]                                       |
| 4                               | 1-2, 3-4, 5-6, 7-8                 | None            | Standard       | Solder Turrent       | <b>29ET6-T</b>    | -                | D                      | 57,2 [2.25]                                       |

\* Mechanical momentary position, electrically maintained position (solenoid energized).

<sup>1</sup> Reference dimensional drawings on page 6.

# MICRO SWITCH™ Magnetically Held Toggle Switches, ET Series

## THREE-POSITION ORDER GUIDE

Table 4. Three-Position ET Series

| No. of Poles/<br>Basic Switches | Circuit Made With Toggle Lever At: |          |                  | Lever Type     | Termination    | Catalog Listing   | Military Number   | Electrical Rating Code | Housing height (Dimension A) mm [in] <sup>1</sup> |
|---------------------------------|------------------------------------|----------|------------------|----------------|----------------|-------------------|-------------------|------------------------|---|
|                                 | Keyway*                            | Center   | Opposite Keyway* |                |                |                   |                   |                        |   |
| 2                               | 1-3, 4-5                           | 1-2, 4-5 | 1-2, 4-6         | Push-to-unlock | Solder Turrent | <b>27ET51-T</b>   | -                 | C                      | 58,0 [2.28]                                       |
| 2                               | 1-3, 4-5                           | 1-2, 4-5 | 1-2, 4-6         | Standard       | Solder Turrent | <b>27ET61-T</b>   | <b>M5594/3-1</b>  | C                      | 58,0 [2.28]                                       |
| 2                               | 1-3, 4-5                           | 1-2, 4-5 | 1-2, 4-6         | Pull-to-unlock | Solder Turrent | <b>27ET61-T-E</b> | <b>M5594/6-1E</b> | C                      | 58,0 [2.28]                                       |
| 2                               | 1-3, 4-5                           | 1-2, 4-5 | 1-2, 4-6         | Pull-to-unlock | Solder Turrent | <b>27ET61-T-L</b> | <b>M5594/6-1L</b> | C                      | 58,0 [2.28]                                       |
| 2                               | 1-3, 4-5                           | 1-2, 4-5 | 1-2, 4-6**       | Pull-to-unlock | Solder Turrent | <b>27ET61-T-M</b> | <b>M5594/6-1M</b> | C                      | 58,0 [2.28]                                       |

\* Mechanical momentary position, electrically maintained position (solenoid energized).

\*\* Mechanical lever lock position.

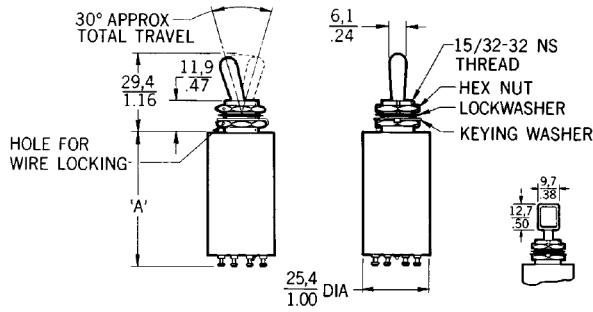
<sup>1</sup> Reference dimensional drawings on page 6.

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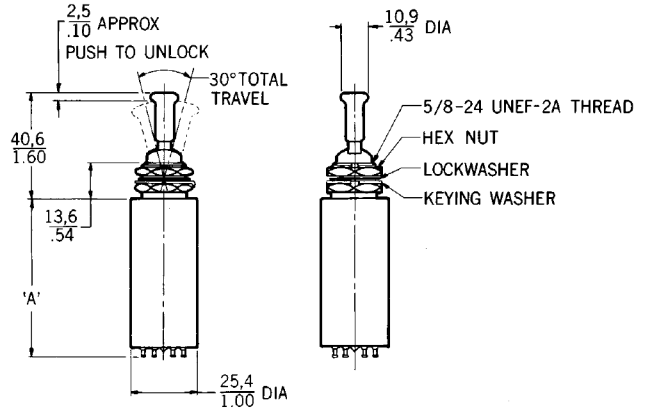
## DIMENSIONAL DRAWINGS

Figure 1. Standard Dimensions

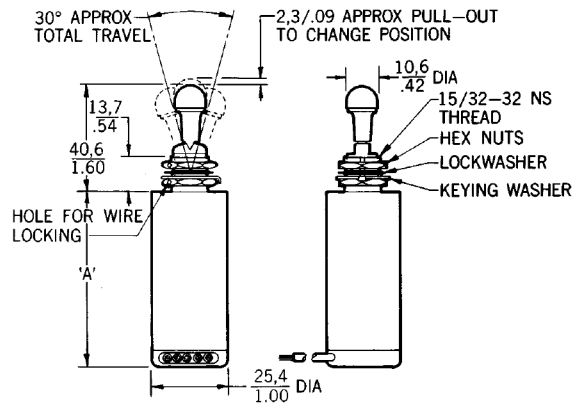
### Standard and tab toggle levers



### Push-to-unlock toggle lever



### Pull-to-unlock toggle lever



### LOCKING CONFIGURATION

| E  | M   |
|--|---|
|  |   |
| Locked In Center Position                    | Locked Out Of And Into Extreme Position (Opposite Keyway) |
| F  | L   |
|  |   |
| Locked In Extreme Position (Opposite Keyway) | Locked Out Of Extreme Position (Keyway Side)              |

Key: 0,0 = mm  
0.00 = inches

## ADDITIONAL MATERIALS

The following associated literature is available on the Honeywell web site at [sensing.honeywell.com](http://sensing.honeywell.com):

- Product line guide
- Product range guide
- Application note: Flight deck toggle switches

### **WARNING** **PERSONAL INJURY**

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

**Failure to comply with these instructions could result in death or serious injury.**

### **WARNING** **MISUSE OF DOCUMENTATION**

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

**Failure to comply with these instructions could result in death or serious injury.**

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