Honeywell

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-ridden 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 the 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

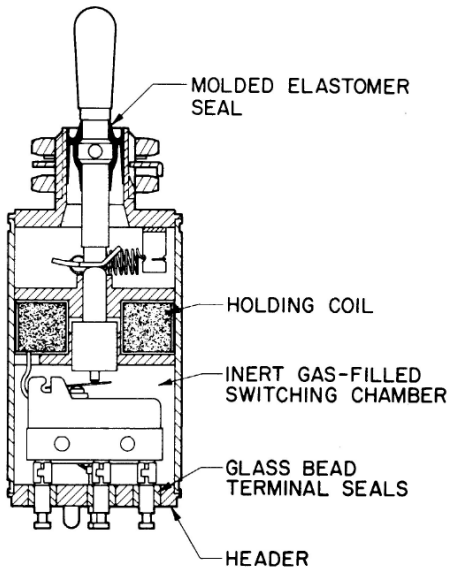
Characteristic	Parameter
Description	Military-grade toggle switch with magnetic “hold” capabilities
Sealing	Sealed to SAE AS55941 specifications
Operating temperature	-65 °C to 71 °C [-85 °F to 160 °F]
Lever actuator styles (metal)	Standard lever, tab lever, pull-to-unlock lever, push-to-unlock lever
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[1]	2.5[1]	–

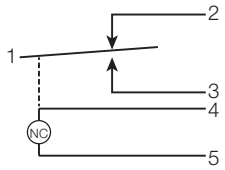
[1] 50,000 ft for Rating Code D.

TYPICAL ET SWITCH CONSTRUCTION

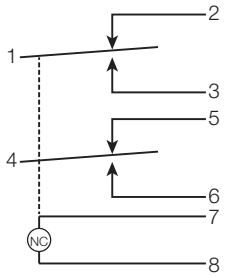


CIRCUITRY

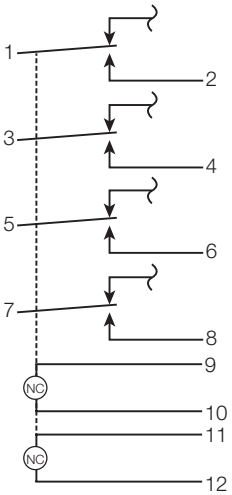
Single-Pole Double-Throw



Double-Pole Double-Throw



Four-Pole Single-Throw

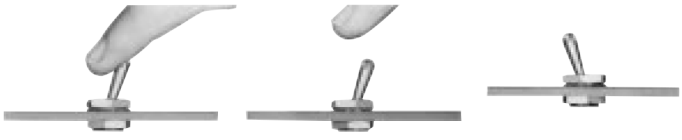


MICRO SWITCH™ Magnetically Held Toggle Switches, ET Series

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.



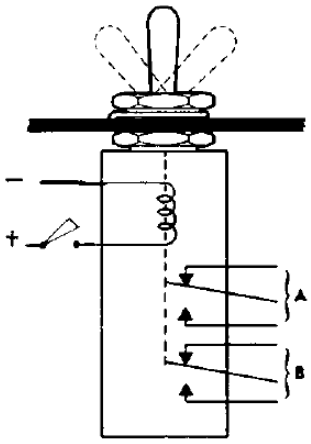
(1) (2) (3)

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 tranferred 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.

Standard Pull-to-unlock Push-to-unlock 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.

Turret Leadwire Screw

TWO-POSITION ORDER GUIDE

Table 3. Two-Position ET Series

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

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

[1] Reference dimensional drawings on page 6.

THREE-POSITION ORDER GUIDE

Table 4. Three-Position ET Series

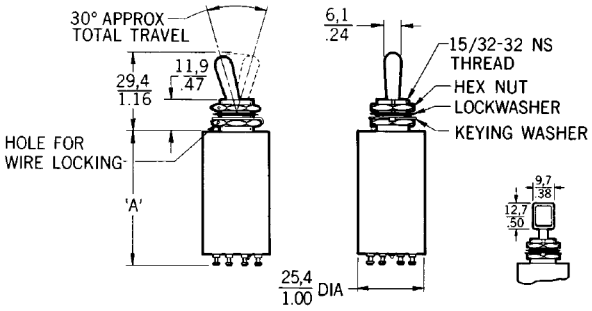
	Circuit Made With Toggle Lever At:								
No. of Poles/ Basic Switches	**Keyway***	**Center**	**Opposite Keyway***	**Lever Type**	**Termination**	**Catalog Listing**	**Military Number**	**Electrical Rating Code**	**Housing height (Dimension A) mm [in][1]**
2	1-3, 4-5	1-2, 4-5	1-2, 4-6	Push-to-unlock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

* Mechanical momentary position, electrically maintained position (solenoid energized).
** Mechanical lever lock position.
[1] Reference dimensional drawings on page 6.

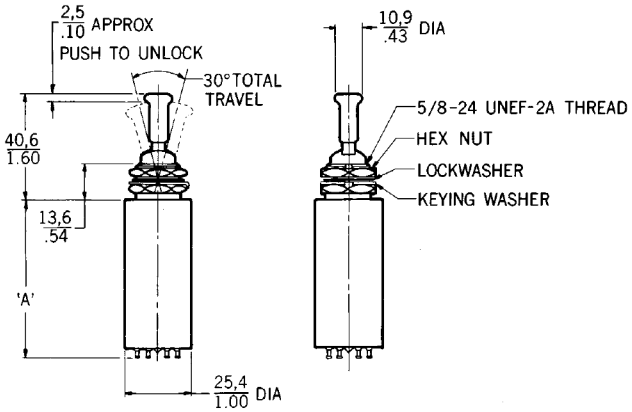
DIMENSIONAL DRAWINGS

Figure 1. Standard Dimensions

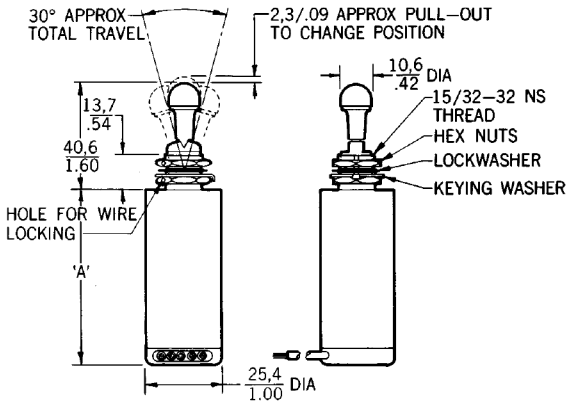
Standard and tab toggle levers



Push-to-unlock toggle lever



Pull-to-unlock toggle lever



Key: 0,0 = mm / 0.00 = inches

LOCKING CONFIGURATION

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

ADDITIONAL MATERIALS

The following associated literature is available on the Honeywell web site at 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.

Warranty/Remedy

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

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