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Sensing and Control
Honeywell Inc.
11 West Spring Street
Freeport, IL 61032

www.honeywell.com/sensing

Manual Switches

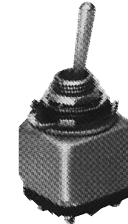
Miniature Toggle Switches



1TW Standard unsealed toggle lever
1/4" bushing



2TW101 Standard sealed toggle lever
1/4" bushing



11TW Standard toggle lever
15/32" bushing

12TW Pull-to-unlock toggle lever
15/32" bushing

- Qualified to MIL-S-83781
- Save space and weight
- SPDT and DPDT circuitry
- Choice of 1/4" or 15/32" bushings
- 15/32" bushing has lever seal
- Pull-to-unlock option on 15/32" bushing

- UL Recognized
- Temperature range: -85°F to +160°F (-65°C to +71°C)
- Sealed bushing versions

Molded-in terminals are plated for soldering. There is positive return on momentary versions. All switches come with a lockwasher, a keying washer, and two hexnuts. Special "on-on-on" circuitries, similar to those shown for TL, are also available for TW.

ELECTRICAL RATING

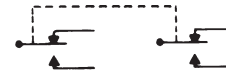
Volts	Amperes		
	Resistive	Inductive	Lamp
30 VDC	5	2	1
115 VAC	5	2	1
UL Code 117	5 amps @ 125 VAC		

CIRCUITRY

1¹ Single Pole Double Throw



2¹ Two Single Pole Double Throw Circuits

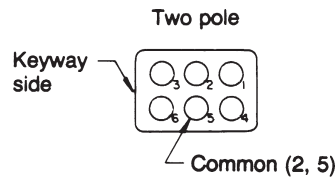
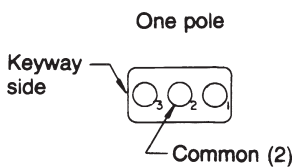


¹Refer to order guides.

TERMINAL CIRCUIT IDENTIFICATIONS

Terminal identifications are referred to in the Ordering Charts to indicate which circuits are made in each toggle position

(i.e., "1-2" reference indicates circuit closure through terminals 1 and 2).



Manual Switches

Miniature Toggle Switches

2-POSITION ORDER GUIDES

Switches with 15/32" Bushings

No. Poles	Circuits Made with Toggle at:		Sealed Standard Toggle		Sealed Pull-to-Unlock Toggle**	
	Keyway Position	Opposite Keyway	Catalog Listing	Military No.	Add Suffix (next page) to Listing	Military No.**
1	OFF	2-3 ON	11TW1-2	MS27718-22-1	D, F, G	MS27720-22-1
1	2-1 ON	2-3 ON	11TW1-3	MS27718-23-1	D, F, G	MS27720-23-1
1	2-1 ON*	2-3 ON	11TW1-8	MS27718-26-1	F	MS27720-26-1
2	OFF	2-3 & 5-6 ON	12TW1-2	MS27719-22-1	D, F, G	MS27721-22-1
2	2-1 & 5-4 ON	2-3 & 5-6 ON	12TW1-3	MS27719-23-1	D, F, G	MS27721-23-1
2	2-1 & 5-4 ON*	2-3 & 5-6 ON	12TW1-8	MS27719-26-1	F	MS27721-26-1

* These positions are momentary. All others are maintained.

** Also add appropriate suffix letter to the Military Number.

Switches with 1/4" Bushings

No. Poles	Circuits Made with Toggle at:		Unsealed Standard Toggle		Sealed Standard Toggle
	Keyway Position	Opposite Keyway	Catalog Listing	Military No.	Catalog Listing
1	OFF	2-3 ON	1TW1-2	MS27716-22-1	1TW101-2
1	2-1 ON	2-3 ON	1TW1-3	MS27716-23-1	1TW101-3
1	2-1 ON*	2-3 ON	1TW1-8	MS27716-26-1	1TW101-8
2	OFF	2-3 & 5-6 ON	2TW1-2	MS27717-22-1	2TW101-2
2	2-1 & 5-4 ON	2-3 & 5-6 ON	2TW1-3	MS27717-23-1	2TW101-3
2	2-1 & 5-4 ON*	2-3 & 5-6 ON	2TW1-8	MS27717-26-1	2TW101-8

* These positions are momentary. All others are maintained.

3-POSITION ORDER GUIDES

Switches with 15/32" Bushings

No. Poles	Circuits Made with Toggle at:			Sealed Standard Toggle		Sealed Pull-to-Unlock Toggle	
	Keyway Position	Center Position	Opposite Keyway	Catalog Listing	Military No.	Add Suffix (next page) to Listing	Military No.**
1	2-1 ON	OFF	2-3 ON	11TW1-1	MS27718-21-1	ALL	MS27720-21-1
1	2-1 ON*	OFF	2-3 ON	11TW1-5	MS27718-31-1	E, F, K, L, M, N	MS27720-31-1
1	2-1 ON*	OFF	2-3 ON*	11TW1-7	MS27718-27-1	E, L, N	MS27720-27-1
2	2-1 & 5-4 ON	OFF	2-3 & 5-6 ON	12TW1-1	MS27719-21-1	ALL	MS27721-21-1
2	2-1 & 5-4 ON*	OFF	2-3 & 5-6 ON	12TW1-5	MS27719-31-1	E, F, K, L, M, N	MS27721-31-1
2	2-1 & 5-4 ON*	OFF	2-3 & 5-6 ON*	12TW1-7	MS27719-27-1	E, L, N	MS27721-27-1

* These positions only are momentary. All others are maintained.

** Also add appropriate suffix letter to the Military Number.

Switches with 1/4" Bushings

No. Poles	Circuits Made with Toggle at:			Unsealed Standard Toggle		Sealed Standard Toggle
	Keyway Position	Center Position	Opposite Keyway	Catalog	Military No.	Catalog Listing
1	2-1 ON	OFF	2-3 ON	1TW1-1	MS27716-21-1	1TW101-1
1	2-1 ON*	OFF	2-3 ON	1TW1-5	MS27716-31-1	1TW101-5
1	2-1 ON*	OFF	2-3 ON*	1TW1-7	MS27716-27-1	1TW101-7
2	2-1 & 5-4 ON	OFF	2-3 & 5-6 ON	2TW1-1	MS27717-21-1	2TW101-1
2	2-1 & 5-4 ON*	OFF	2-3 & 5-6 ON	2TW1-5	MS27717-31-1	2TW101-5
2	2-1 & 5-4 ON*	OFF	2-3 & 5-6 ON*	2TW1-7	MS27717-27-1	2TW101-7

* These positions are momentary. All others are maintained.














Toggle/Rockers

Manual Switches

Miniature Toggle Switches

LOCKING CONFIGURATION SUFFIX

When ordering pull-to-unlock toggle listings, add the suffix letter shown in this chart to the standard toggle catalog listing and the Military Approval number.

A  Locked In Three Positions	B  Locked In Center and Extreme Position (Keyway Side)	D  Locked Out Of Center Position	E  Locked In Center Position	F  Locked In Extreme Position (Opposite Keyway)	G  Locked In Extreme Position (Keyway Side)	H  Locked Out Of Center And Extreme Position (Keyway Side)
J  Locked Out Of Center And Extreme Position (Opposite Keyway)	K  Locked In Center And Extreme Position (Opposite Keyway)	L  Locked Out Of Extreme Position (Keyway Side)	M  Locked Out Of And Into Extreme Position (Opposite Keyway)	N  Locked Out Of Extreme Position (Opposite Keyway)	P  Locked Out Of And Into Extreme Position (Keyway Side)	



WITH IWTS TERMINATION

- $15/32$ " bushing has lever seal
- One or two pole circuitry
- Accepts #20 wire using M39029/1-101 contact pins
- Connections resist shock, vibration, and high pulling force

2 - POSITION ORDER GUIDE — IWTS TERMINATION

No. Poles	Circuits Made with Toggle at:		Standard Toggle	Pull-to-Unlock Toggle
	Keyway Position	Opposite Keyway	Catalog Listing	Add Suffix to Standard Listing
1	2-1 ON	2-3 ON	111TW1-3	D, F, G
1	2-1 ON*	2-3 ON	111TW1-8	F
2	2-1 & 5-4 ON	2-3 & 5-6 ON	112TW1-3	D, F, G
2	2-1 & 5-4 ON*	2-3 & 5-6 ON	112TW1-8	F

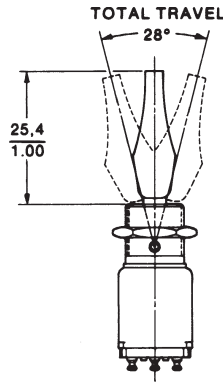
3 - POSITION ORDER GUIDE — IWTS TERMINATION

No. Poles	Circuits Made with Toggle at:			Standard Toggle	Pull-to-Unlock Toggle
	Keyway Position	Center Position	Opposite Keyway	Catalog Listing	Add Suffix to Standard Listing
1	2-1 ON	OFF	2-3 ON	111TW1-1	ALL
1	2-1 ON*	OFF	2-3 ON	111TW1-5	E, F, K, L, M, N
1	2-1 ON*	OFF	2-3 ON*	111TW1-7	E, L, N
2	2-1 & 5-4 ON	OFF	2-3 & 5-6 ON	112TW1-1	ALL
2	2-1 & 5-4 ON*	OFF	2-3 & 5-6 ON	112TW1-5	E, F, K, L, M, N
2	2-1 & 5-4 ON*	OFF	2-3 & 5-6 ON*	112TW1-7	E, L, N

* These positions only are momentary. All others are maintained.

Manual Switches

Miniature Toggle Switches



WITH COLORED TAB LEVERS

- Available in seven colors
- Affords attractive front-of-panel appearance for graphic display and functional identify
- Levers made to withstand temperatures up to 160°F (71°C)
- Switches furnished with decorative knurled nut, a lockwasher, a keying washer, and a hex nut
- 15/32" bushing has lever seal
- Solder terminals (available with IWTS termination)

ORDER GUIDE

To order, combine the basic (function) listing from Table 1 with the desired lever color suffix from Table 2. Colored tab levers are not available with 1/4 in. bushing.

TABLE 1 — TOGGLE POSITION AND CONTACT ARRANGEMENT

Positions	No. Poles	Circuits Made with Toggle at:			Basic Listing Add color suffix from Table 2.
		Keyway Position	Center Position	Opposite Keyway	
2	1	OFF	NONE	2-3 ON	11TW19-2 -
2	1	2-1 ON	NONE	2-3 ON	11TW19-3 -
2	1	2-1 ON*	NONE	2-3 ON	11TW19-8 -
2	2	OFF	NONE	2-3 & 5-6 ON	12TW19-2 -
2	2	2-1 & 5-4	NONE	2-3 & 5-6 ON	12TW19-3 -
2	2	2-1 & 5-4*	NONE	2-3 & 5-6 ON	12TW19-8 -
3	1	2-1 ON	OFF	2-3 ON	11TW19-1 -
3	1	2-1 ON*	OFF	2-3 ON	11TW19-5 -
3	1	2-1 ON*	OFF	2-3 ON*	11TW19-7 -
3	2	2-1 & 5-4 ON	OFF	2-3 & 5-6 ON	12TW19-1 -
3	2	2-1 & 5-4 ON*	OFF	2-3 & 5-6 ON	12TW19-5 -
3	2	2-1 & 5-4 ON*	OFF	2-3 & 5-6 ON*	12TW19-7 -

* These positions only are momentary. All others are maintained.

TABLE 2 — TAB LEVER COLORS

Tab Lever Color	White	Black	Blue	Red	Green	Orange	Light Gray
Color suffix	A001	A002	A003	A004	A005	A006	A007

TW SWITCHES WITH SPECIAL CIRCUITRIES

All 2-pole 3-position TW switches are available with special "on-on-on" -10, -50, -70 circuitry options as shown below.

2-Pole 3-Position Switches			Sealed Standard Toggle		Unsealed Std. Toggle	Sealed Tab Lever
Circuits Made With Toggle At:			15/32" bushing	1/4" bushing	1/4" bushing	15/32" bushing
Keyway Position	Center Position	Opposite Keyway	Catalog Listing	Catalog Listing	Catalog Listing	Catalog Listing Add color suffix from Table 2
2-1 & 5-4 ON	2-1 & 5-6 ON	2-3 & 5-6 ON	12TW1-10	2TW101-10	2TW1-10	12TW19-10 -
2-1 & 5-4 ON*	2-1 & 5-6 ON	2-3 & 5-6 ON	12TW1-50	2TW101-50	2TW1-50	12TW19-50 -
2-1 & 5-4 ON*	2-1 & 5-6 ON	2-3 & 5-6 ON*	12TW1-70	2TW101-70	2TW1-70	12TW19-70 -

* These positions are momentary. All others are maintained.

Toggle/Rockers

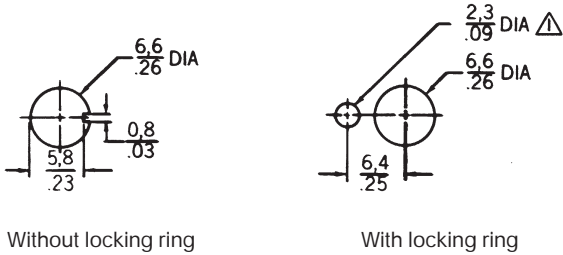
Manual Switches

Miniature Toggle Switches

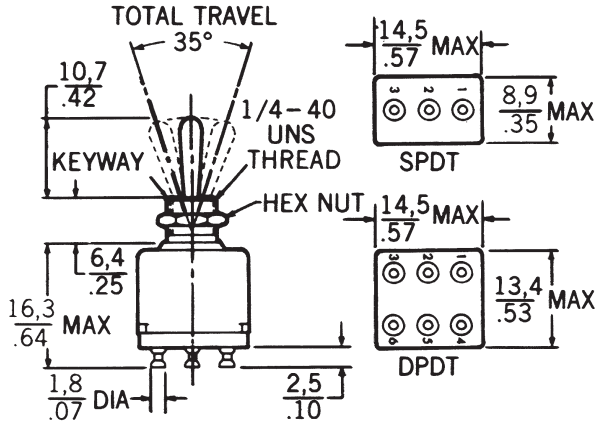
TW Series

MOUNTING DIMENSIONS (For reference only)

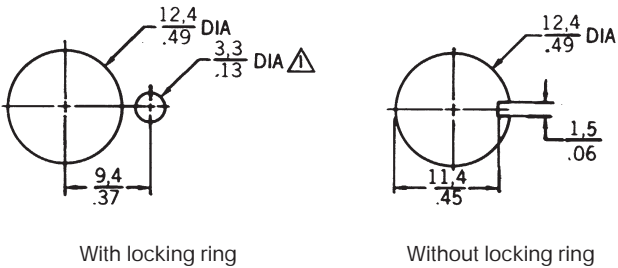
Mounting detail for 1/4" bushing switches



Dimensions for 1/4" bushing switches



Mounting detail for 15/32" bushing switches

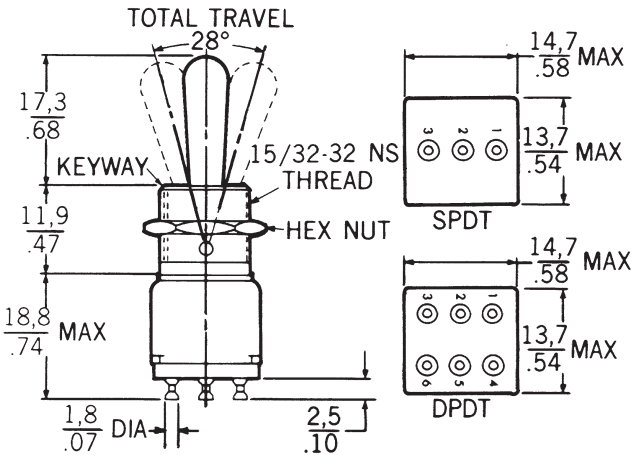


Note: Δ 1,1/05 MIN. DEEP TO ACCOMMODATE LOCKING RING.
FOR SWITCHES USING PANEL SEAL, DO NOT ALLOW THRU HOLE MOUNTING.

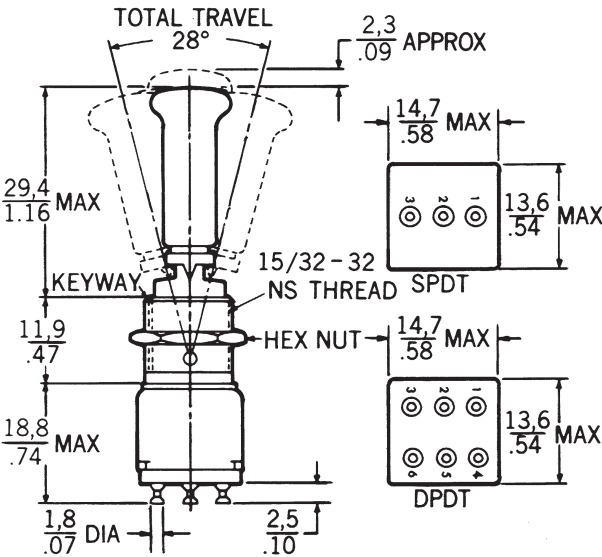
Key: $\frac{0,0}{0.00} = \text{mm}$
 $\frac{0,00}{0.00} = \text{inches}$

Dimensions for 15/32" switches

Standard toggle lever



Pull-to-unlock toggle lever



Bushing mounting torque is 10-15 in./lbs.