

MICRO SWITCH™ Miniature
Military-Grade Toggle Switches
TW Series



MICRO SWITCH™ TW Series

Miniature Military-Grade Toggle Switches

Honeywell MICRO SWITCH™ TW Series toggle switches are military qualified to MIL-83731 specifications for sealed and unsealed toggle switches. Quality construction features include an available bonded seal between the toggle lever and bushing for those applications where a sealing-related failure cannot be tolerated.

The durable design of the TW Series toggle is well-suited for many military, aerospace and other demanding applications where space behind the panel is limited. These applications include environments where the panels are subjected to mechanical shock, vibration, dust, splashing or hose-directed water, and temperature extremes.

MICRO SWITCH™ TW toggles feature a miniature military-grade design with environmental sealing capabilities and can be configured with a large selection of circuitries, electrical terminations, lever and bushing designs, and contact material options to satisfy a diverse range of applications.

What makes our switches better?

- MIL-DTL-83731 qualified switches available to meet military specifications
- Environmental sealing availability enables switches to withstand many demanding indoor and outdoor applications
- Miniature size (small footprint) for applications where behind-the-panel space is at a minimum
- 2- and 3-position, maintained and momentary toggle action to meet circuit and actuator requirements



MILITARY QUALIFIED • GLOBAL APPROVALS
MINIATURE • HIGH PERFORMANCE

Features and Benefits

MIL-QUALIFIED AND GLOBAL APPROVALS

MIL-DTL-83731 qualified switches are available to meet military/aerospace specifications. TW Series toggles' available environmental sealing through the use of a bonded seal between the toggle lever and bushing enables these switches to **withstand potentially demanding conditions**. Unsealed varieties are also available for less harsh environments.

Saves space and weight

VARIETY OF CIRCUITRIES AND OPERATING ACTIONS

TW Series' **1- and 2- pole options** along with **2- and 3-position, maintained and momentary** toggle action is designed to provide for a breadth of circuitry and actuator requirements. They thrive in a wide range of temperatures from -65 °C to 71 °C [-85 °F to 160 °F], and are available in 1/4 in and 15/32 in bushing diameters to meet specific application requirements.

Standard, locking, & colored paddle levers

LOCKING LEVERS AND PADDLES

Optional **lever locks** (pull-to-unlock) require two separate actions to actuate the switch in order to prevent unintended actuation. MICRO SWITCH™ TW Series toggles feature many lever choices including standard, locking, tabs, color options, and paddles available in various colors.

MULTIPLE CONNECTION OPTIONS

MICRO SWITCH™ TW Series toggles offer **three popular termination options**: screw, solder, and IWTS (Integrated Wire Termination System). The IWTS termination accepts #20 wire using M39029/1-101 contact pins and resists shock, vibration, and high pulling force.

EASILY CONTROLS LOW-VOLTAGE DC APPLICATIONS

Toggle switches available with a choice of **silver alloy or gold-plated contacts** to handle a variety of electrical load requirements.

ROBUST CONSTRUCTION

Built from **military-grade components** to achieve MIL-DTL-83731 requirements and boasts an electrical endurance of 20,000 cycles at full load.

Potential Applications



MILITARY AND COMMERCIAL AIRCRAFT AND HELICOPTERS

Used in fixed wing aircraft and helicopter flight decks. Honeywell has a long history of providing TW Series toggle switches in commercial and military aircraft.

AVIATION GROUND SUPPORT EQUIPMENT

Used to turn on and operate various components of aviation ground support equipment, such as pumps, lights, and lift platforms.

MILITARY LAND VEHICLES (TRACK AND WHEELED VEHICLES)

Used in military land vehicles to control lights, pumps, arming equipment, and movement control of lifts/ramps, etc.



INDUSTRIAL MACHINERY AND CONSTRUCTION EQUIPMENT

Often used on road milling, road pavers, trenchers, and stump cutters to operate movement of machinery and/or turn on lights, pumps, etc.

PROCESS CONTROL

Often used in remote controllers and other devices for construction, rail, industrial, and other transportation applications.



MICRO SWITCH™ Miniature Military-Grade Toggle Switches

Table 1. Specifications

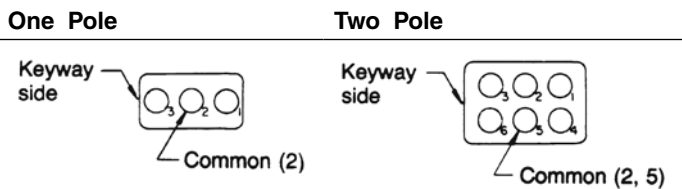
Characteristic	Parameter
Description	miniature military-grade toggle switch
Sealing	qualified to MIL-DTL-83731
Operating temperature	-65 °C to 71 °C [-85 °F to 160 °F]
Actuators	standard, locking, special design, paddle
Action	2- or 3- position; momentary and maintained
Mounting	bushing 15/32 in (0.47 in) Ø; 1/4 in (0.25 in) Ø
Circuitry	SPDT, DPDT, SPST, DPST
Terminations	IWTS, solder (T and T2), quick connect (H58)
Contacts	fine silver or gold-plated
Amp rating	0.1 A to 5.0 A @ 0.5 Vdc to 28 Vdc 0.1 A to 5.0 A @ 0.5 Vac to 115 Vac
Approvals	UL, qualified to MIL-DTL-83781
Measurement	49,78 mm H x 14,61 mm W x 14,61 mm D [1.96 in H x 0.575 in W x 0.575 in D]

Table 2. Electrical Ratings (in amperes)

Volts	Resistive	Inductive	Lamp
30 Vdc	5	2	1
115 Vac	5	2	1
UL Code 117	5 A @ 125 Vac		

TERMINAL CIRCUIT IDENTIFICATION

Terminal identifications are referred to in the order guides to indicate which circuits are made in each toggle position (i.e., 1-2 refers to circuit closure through terminals 1 and 2).



TERMINALS

In addition to the solder terminal listings in the order guides, IWTS (Integrated Wire Termination System) and quick connection versions are also available.

IWTS provides a reliable, serviceable unit and promotes maintainability since wiring bundles need not be disturbed. Leads are quickly and easily assembled or removed with an insert-extract tool. A unique three-rib (grommet style) elastomer seal protects the lead connections without potting. There are no exposed metal terminals. Versions available that will accept No. 20 wire with MS39029/1-101 contact pins. Connections are resistant to shock, vibration, and high pull-out force.

SPECIAL CIRCUITRIES

Catalog listings with -10, -50, and -70 suffix numbers, as shown in the order guides, have special “on-on-on” circuits, as illustrated below.

-10 CIRCUITRY

No of poles	Keyway Side Maint. Position	Center Maint. Position	Opposite Keyway Maint. Position
2			

-50 CIRCUITRY

No of poles	Keyway Side Maint. Position	Center Maint. Position	Opposite Keyway Maint. Position
2			

-70 CIRCUITRY

No of poles	Keyway Side Maint. Position	Center Maint. Position	Opposite Keyway Maint. Position
2			

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TW SERIES TWO-POSITION ORDER GUIDE

Table 3. Two-Position TW Series with 15/32 in Bushing

No. of poles	Terminals	Circuits Made with Toggle At:		Sealed Standard Toggle		Pull-to-Unlock Toggle		Colored Paddle Lever***
		Keyway Position	Opposite Keyway	Catalog Listing	Military Number	Add Suffix to Standard Toggle Listing [^]	Military Number**	Add Paddle Color Suffix to _
1 	solder	OFF	2-3 ON	11TW1-2	MS27718-22-1	D, F, G	MS27720-22-1	11TW19-2_
	solder	2-1 ON	2-3 ON	11TW1-3	MS27718-23-1	D, F, G	MS27720-23-1	11TW19-3_
	solder	2-1 ON*	2-3 ON	11TW1-8	MS27718-26-1	F	MS27720-26-1	11TW19-8_
	IWTS	2-1 ON	2-3 ON	111TW1-3	-	D, F, G	-	-
	ITWS	2-1 ON*	2-3 ON	111TW1-8	-	F	-	-
2 	solder	OFF	2-3, 5-6 ON	12TW1-2	MS27719-22-1	D, F, G	MS27721-22-1	12TW19-2_
	solder	2-1, 5-4 ON	2-3, 5-6 ON	12TW1-3	MS27719-23-1	D, F, G	MS27721-23-1	12TW19-3_
	solder	2-1, 5-4 ON*	2-3, 5-6 ON	12TW1-8	MS27719-26-1	F	MS27721-26-1	12TW19-8_
	IWTS	2-1, 5-4 ON	2-3, 5-6 ON	112TW1-3	-	D, F, G	-	-
	IWTS	2-1, 5-4 ON*	2-3, 5-6 ON	112TW1-8	-	F	-	-



* These positions are momentary. All others are maintained.

** Also add the appropriate suffix to the military number.

*** See page 11 for paddle lever colors

[^] See page 11 for locking configurations.

Table 4. Two-Position TW Series with 1/4 in Bushing

No. of poles	Terminals	Circuits Made with Toggle At:		Unsealed Standard Toggle		Sealed Standard Toggle
		Keyway Position	Opposite Keyway	Catalog Listing	Military Number	Catalog Listing
1 	solder	OFF	2-3 ON	1TW1-2	MS27716-22-1	1TW101-2
	solder	2-1 ON	2-3 ON	1TW1-3	MS27716-23-1	1TW101-3
	solder	2-1 ON*	2-3 ON	1TW1-8	MS27716-26-1	1TW101-8
2 	solder	OFF	2-3, 5-6 ON	2TW1-2	MS27717-22-1	2TW101-2
	solder	2-1, 5-4 ON	2-3, 5-6 ON	2TW1-3	MS27717-23-1	2TW101-3
	solder	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.



PULL-TO-UNLOCK OPTION

When ordering pull-to-unlock toggle listings (see page 11 for configurations), add the suffix letter shown in the chart on page 11 to the standard toggle listing or the MS part number. For example, to order a 11TW1-2 pull-to-unlock toggle switch with the lever locked out of the center position, add the letter **D** (i.e., 11TW1-2**D**, MS27718-22-1**D**)

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TW SERIES THREE-POSITION ORDER GUIDE

Table 5. Three-Position TW Series with 15/32 in Bushing

No. of poles	Terminals	Circuits Made with Toggle At:			Sealed Standard Toggle		Pull-to-Unlock Toggle		Colored Paddle Lever***
		Keyway Position	Center Position	Opposite Keyway	Catalog Listing	Military Number	Add Suffix to Standard Toggle Listing ^Δ	Military Number**	Add Paddle Color Suffix to _
 1	solder	OFF	OFF	2-3 ON	11TW1-1	MS27718-21-1	ALL	MS27720-21-1	11TW19-1_
	solder	2-1 ON*	OFF	2-3 ON	11TW1-5	MS27718-31-1	E, F, K, L, M, N	MS27720-31-1	11TW19-5_
	solder	2-1 ON*	OFF	2-3 ON*	11TW1-7	MS27718-26-1	E, L, N	MS27720-27-1	11TW19-7_
	IWTS	2-1 ON	OFF	2-3 ON	111TW1-1	–	ALL	–	–
	IWTS	2-1 ON*	OFF	2-3 ON	111TW1-5	–	E, F, K, L, M, N	–	–
	IWTS	2-1 ON*	OFF	2-3 ON*	111TW1-7	–	E, L, N	–	–
 2	solder	OFF	OFF	2-3, 5-6 ON	12TW1-1	MS27719-21-1	ALL	MS27721-21-1	12TW19-1_
	solder	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	12TW19-5_
	solder	2-1, 5-4 ON*	OFF	2-3, 5-6 ON*	12TW1-7	MS27719-27-1	E, L, N	MS27721-27-1	12TW19-7_
	IWTS	2-1, 5-4 ON	OFF	2-3, 5-6 ON	112TW1-1	–	ALL	–	–
	IWTS	2-1, 5-4 ON*	OFF	2-3, 5-6 ON	112TW1-5	–	E, F, K, L, M, N	–	–
	IWTS	2-1, 5-4 ON*	OFF	2-3, 5-6 ON*	112TW1-7	–	E, L, N	–	–



* These positions are momentary. All others are maintained.

** Also add the appropriate suffix to the military number.

*** See page 11 for paddle lever colors

^Δ See page 11 for locking configurations.

Table 6. Three-Position TW Series with 1/4 in Bushing

No. of poles	Circuits Made with Toggle At:			Unsealed Standard Toggle		Sealed Standard Toggle
	Keyway Position	Center Position	Opposite Keyway	Catalog Listing	Military Number	Catalog Listing
 1	OFF	OFF	2-3 ON	1TW1-1	MS27716-21-1	1TW101-1
	2-1 ON*	OFF	2-3 ON	1TW1-5	MS27716-31-1	1TW101-5
	2-1 ON*	OFF	2-3 ON*	1TW1-7	MS27716-27-1	1TW101-6
 2	OFF	OFF	2-3, 5-6 ON	2TW1-1	MS27717-21-1	2TW101-2
	2-1, 5-4 ON*	OFF	2-3, 5-6 ON	2TW1-5	MS27717-31-1	2TW101-3
	2-1, 5-4 ON*	OFF	2-3, 5-6 ON*	2TW1-7	MS27717-26-1	2TW101-8

* These positions are momentary. All others are maintained.


PULL-TO-UNLOCK OPTION

When ordering pull-to-unlock toggle listings (see page 11 for configurations), add the suffix letter shown in the chart on page 11 to the standard toggle listing or the MS part number. For example, to order a 11TW1-7 pull-to-unlock toggle switch with the lever locked in the center position, add the letter **E** (i.e., 11TW1-7**E**, MS27720-27-1**E**)

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Table 7. TW Series Switches with Special Circuitries

All two-pole, three-position TW switches are available with special “on-on-on” **-10, -50, -70** circuitry options as shown below.

No. of poles	Terminals	Circuits Made with Toggle At:			Sealed Standard Toggle		Unsealed Standard Toggle	Sealed Paddle Lever
		Keyway Position	Center Position	Opposite Keyway	15/32 Bushing Catalog Listing	1/4 Bushing Catalog Listing	1/4 Bushing Catalog Listing	15/32 Bushing Catalog Listing***
2 	solder	2-1, 5-4 ON	2-1, 5-6 ON	2-3, 5-6 ON	12TW1- 10	2TW101- 10	2TW1- 10	12TW19- 10 _
	solder	2-1, 5-4 ON*	2-1, 5-6 ON	2-3, 5-6 ON	12TW1- 50	2TW101- 50	2TW1- 50	12TW19- 50 _
	solder	2-1, 5-4 ON*	2-1, 5-6 ON	2-3, 5-6 ON*	12TW1- 70	2TW101- 70	2TW1- 70	12TW19- 70 _

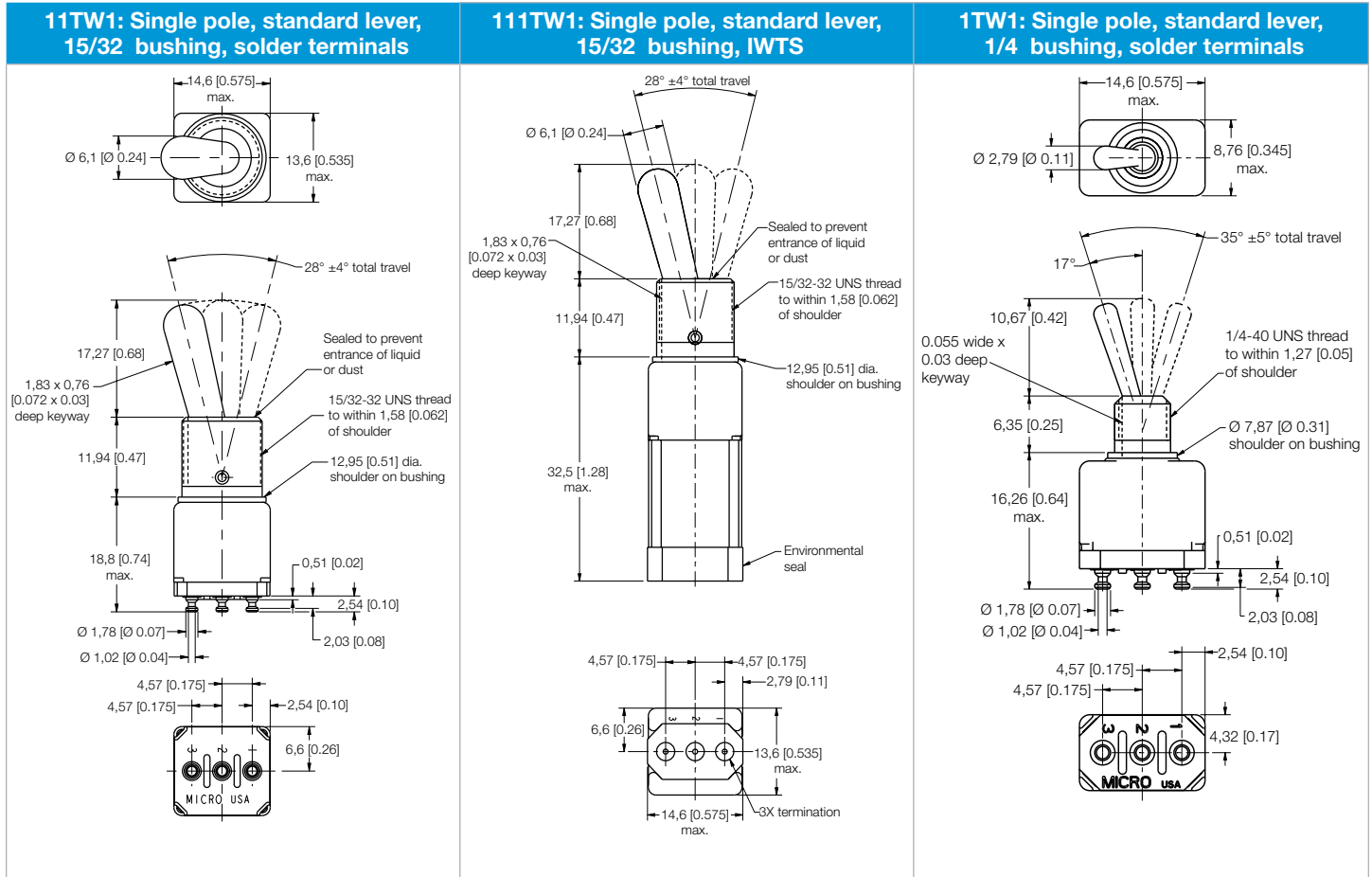
* These positions are momentary. All others are maintained.

*** Add color suffix from Table 8 on page 11.

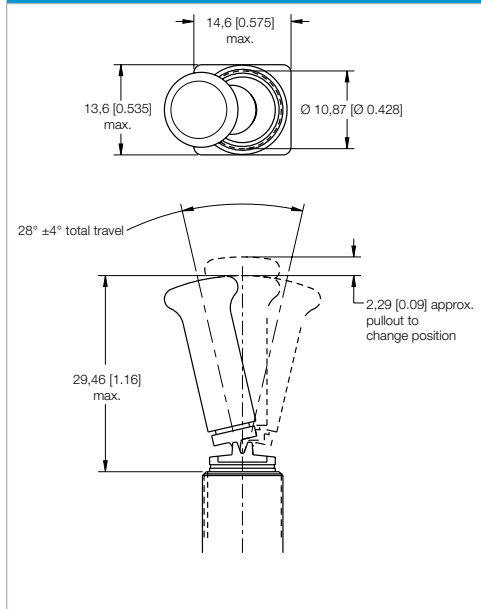
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MICRO SWITCH™ TW SERIES 1-POLE STANDARD ACTUATOR OPTIONS, TERMINALS, & DIMENSIONS

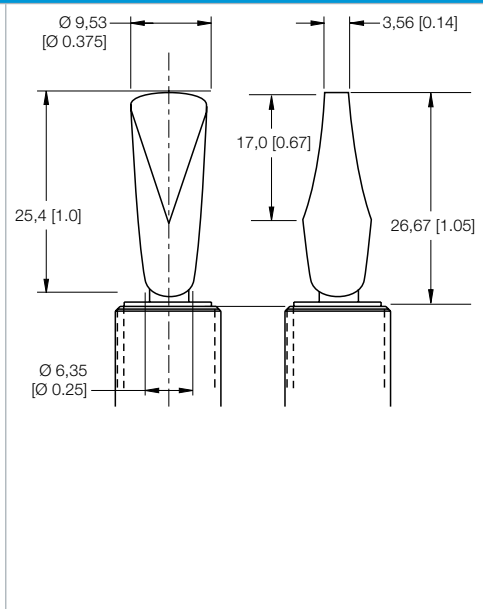
Note: Three-position switches shown



Locking lever dimensions for single pole TW toggles



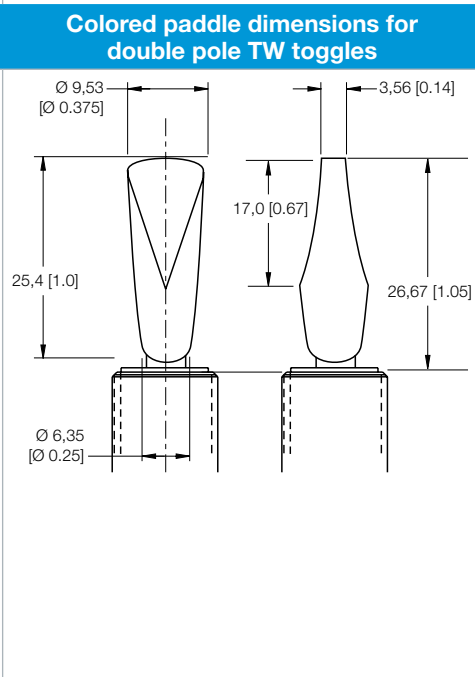
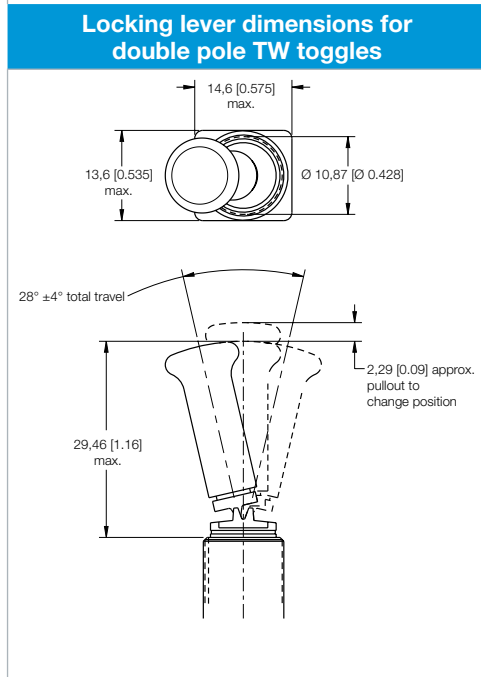
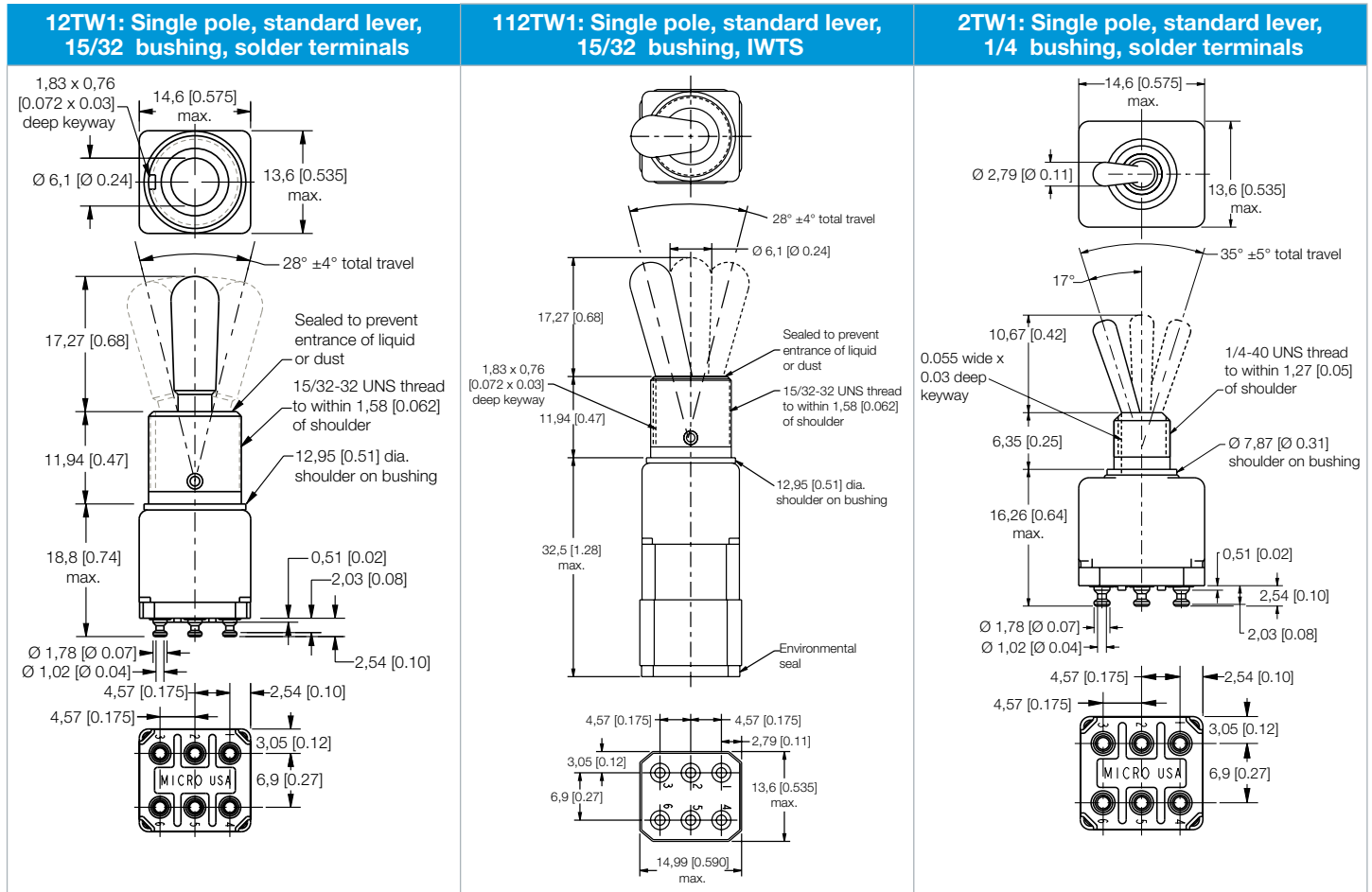
Colored paddle dimensions for single pole TW toggles



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MICRO SWITCH™ TW SERIES 2-POLE STANDARD ACTUATOR OPTIONS, TERMINALS, & DIMENSIONS

Note: Three-position switches shown



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MICRO SWITCH™ TW SERIES LOCKING CONFIGURATIONS














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)	

Table 8. Paddle Lever Colors

Color Suffix	Paddle Lever Color
A001	White
A002	Black
A003	Blue
A004	Red
A005	Green
A006	Orange
A007	Light Grey