



**THE DATASHEET OF**  
**450T328F503A1A1**



# Series 450

## 24mm Rotary Potentiometer

- Versatile Mounting Styles
- Single, Tandem, and Concentric Options
- Power Switch Available
- Panel Seal Available
- Wide Resistance Range
- Low Noise Output
- Insulated and Metal Shaft Options



### Ordering Information

Series	Terminal Style	Mounting Style "A"	Shaft Length "L"	Shaft Trim	Resistance Code	Resistance Tolerance	Taper	Switch Option	A/R Lug Options
450	T	2	20	R	103	B	1	A	1

Code	Spec.
T	Solder lug
X	PC (STD)
Y	PC (Long)
U	PC formed to front
V	PC formed to rear

Metal Shaft	
20	.625" (15.9mm)
24	.750" (19.1mm)
28	.875" (22.2mm)
32	1.000" (25.4mm)
<i>Diameter: 1/4"</i>	
<i>Length increment: 1/32"</i>	
Molded Shaft	
M1	.500" (12.7mm)
M2	.625" (15.9mm) <i>(slotted trim only)</i>
M3	.750" (19.1mm) <i>(slotted trim only)</i>
M4	.875" (22.2mm)
M5	1.000" (25.4mm)
<b>NOTES:</b>	
*Shaft length reduced by .014" when molded bushing is used.	
*Molded shafts for use with pot or pot w/rotary switch only.	

Code	Spec.
A	±10%
B	±20%

Code	Spec.
1	Linear
2	10% AUD
3	10% CCW AUD

Code	Resistance
501	500 Ω
102	1 kΩ
252	2.5 kΩ
502	5 kΩ
103	10 kΩ
253	25 kΩ
104	100 kΩ

Code	Spec.
1	Left side lug
4	Right side lug
5	No lug
6	Bilateral lugs <i>(Available with brass bushing only)</i>

Code	Switch	Actuation	Type
A	None	—	—
B	SPST	Rotary	050
C	SPST	Rotary	TGC
D	DPST	Rotary	027
E	SPDT	Rotary	028
F	SPST	Push-Pull	FR-K
G	SPST	Push-Push	040
H	SPDT	Push-Push	041
J	SPST	Rotary	FR-GC

Brass Bushing	
2	.250" (6.35mm)
3	.375" (9.53mm)
8	1.000" (25.4mm)
<i>Diameter: 3/8" – 32UNEF-2A</i>	
<i>Length increment: 1/8"</i>	
Die-Cast Bushing	
A	.250" (6.35mm)
B	.375" (9.53mm)
<i>Diameter: 3/8" – 32UNEF-2A</i>	
Molded Bushing	
M	.250" (6.35mm)
<i>Diameter: 3/8" – 32UNEF-2A</i>	
Twist Tab	
1	Twist tab

Code	Spec.
R	Round
F	Flatted
K	Split Knurl
S	Slotted

## Electrical Specifications

Parameter	Conditions & Remarks	Min	Max	Unit
Resistance Range	Linear	100	10 Meg	$\Omega$
	Audio	1k	1 Meg	$\Omega$
Resistance Tolerance	Standard	-30	+30	%
	Special	-20	+20	%
	Special	-10	+10	%
Dielectric Strength	1 minute		1080	VAC
Power Rating	@ 55°C, resistances $\leq 100$ k $\Omega$		1/2	watt
	@ 55°C, resistances $> 100$ k $\Omega$		1/3	watt
Operating Voltage			750	VDC
Insulation Resistance	250 VDC	100		M $\Omega$
Effective Electrical Angle			300	$^{\circ}$

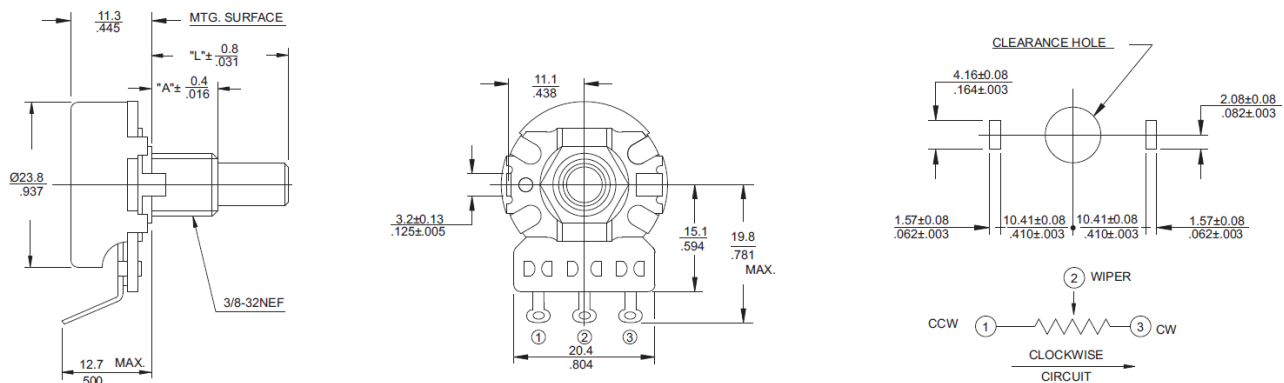
## Mechanical and Environmental

Parameter	Conditions & Remarks	Min	Max	Unit
Operating Temperature Range		-10	+80	$^{\circ}$ C
Rotational Life	Standard	10,000		cycles
	Special	100,000		cycles
	Special	250,000		cycles
Mechanical Angle	Push switch or no switch		300	$^{\circ}$
	With rotary switch		320	$^{\circ}$
Rotational Torque		54	432	gf-cm
Stop Strength		10.36		kgf-cm
Push-Pull Strength of Shaft:	10 kg for 10 seconds			
Soldering Condition:	Maximum temperature of 260°C for 5 seconds			
Packaging:	Standard cardboard box packaging			

All testing is performed at room ambient conditions except as noted. Users should verify device actual performance in their specific applications. This product is compliant to RoHS3 Directive 2015/863 Amendments of Annex II on 31 March 2015, and REACH SVHC Directive EC 1907/2006 Amendments of Annex XIV & Annex XVII on 15 January 2018. Custom and value-added options available on request. Please contact your sales representative for additional information.

## Electrical and Mechanical Specifications

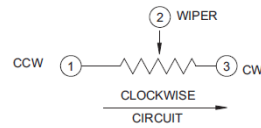
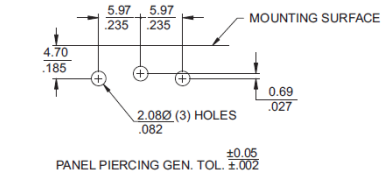
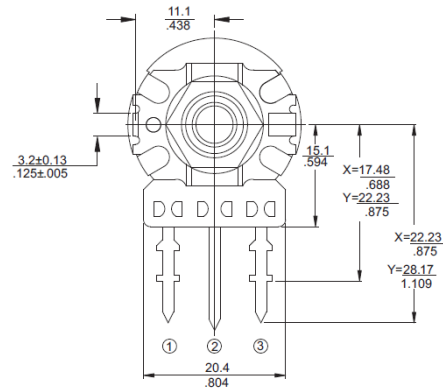
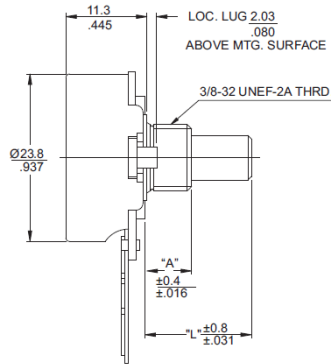
### Series 450T Metal Shaft, Bushing Mount, Solder Lug "T" Type Terminals



DIMENSION:  $\frac{\text{mm}}{\text{inch}}$

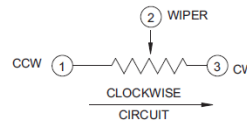
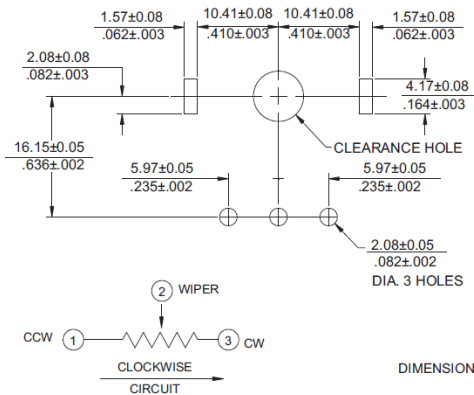
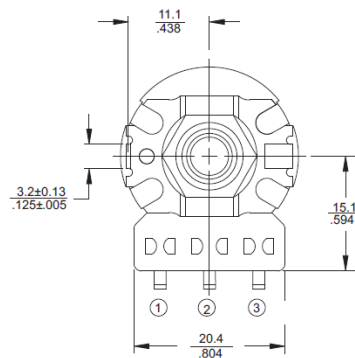
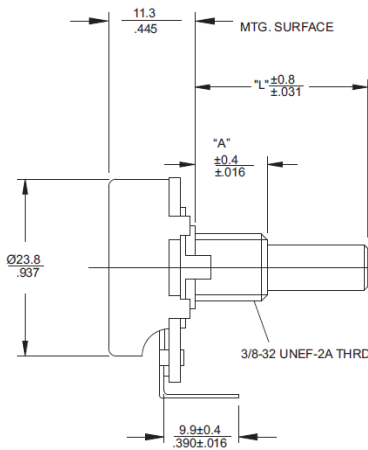
### Electrical and Mechanical Specifications

Series 450X/450Y Metal Shaft, Bushing Mount, Printed Circuit "X" or "Y" Type Terminals



DIMENSION:  $\frac{\text{mm}}{\text{inch}}$

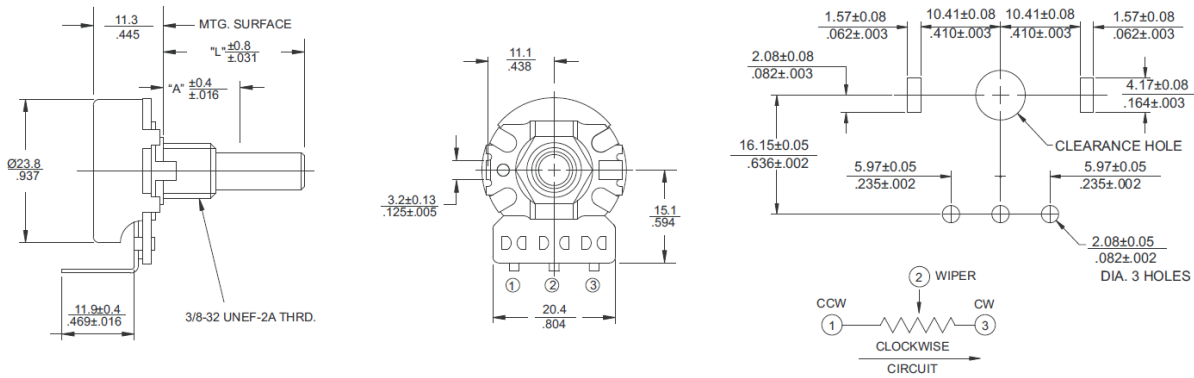
### Series 450U Metal Shaft, Bushing Mount, Printed Circuit "U" Type Terminals



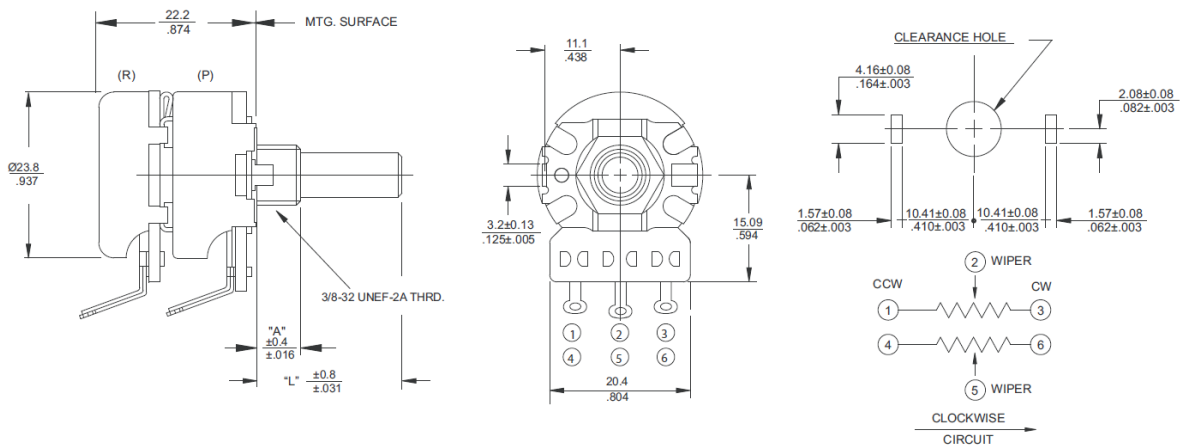
DIMENSION:  $\frac{\text{mm}}{\text{inch}}$

## Electrical and Mechanical Specifications

### Series 450V Metal Shaft, Bushing Mount, Printed Circuit "V" Type Terminals



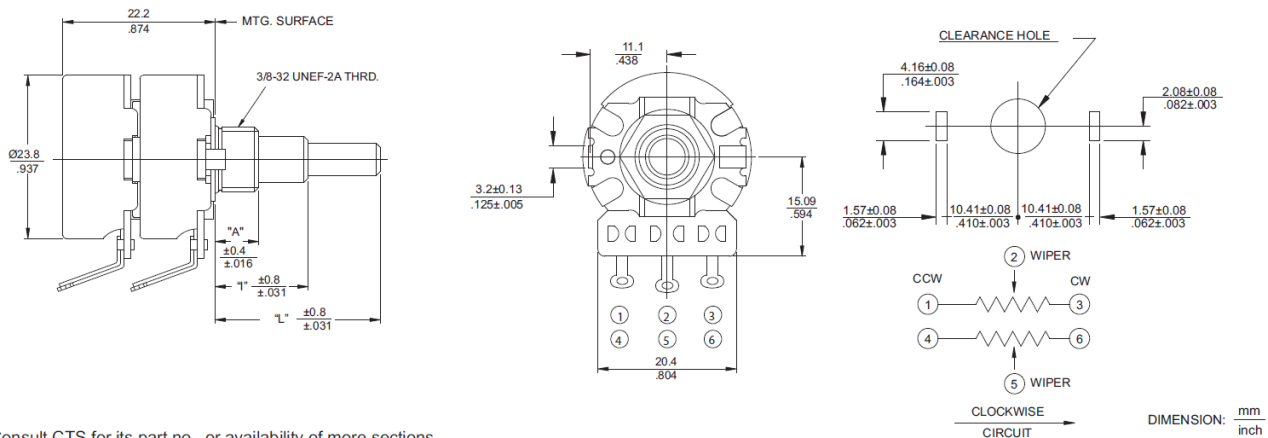
### Series 450T-2 Metal Shaft, Dual Section, Bushing Mount, Solder Lug "T" Type Terminals



\* Consult CTS for its part no. or availability of more sections

DIMENSION:  $\frac{mm}{inch}$

### Series 450T-C2 Concentric Metal Shaft, Dual Section, Bushing Mount, Solder Lug "T" Type Terminals

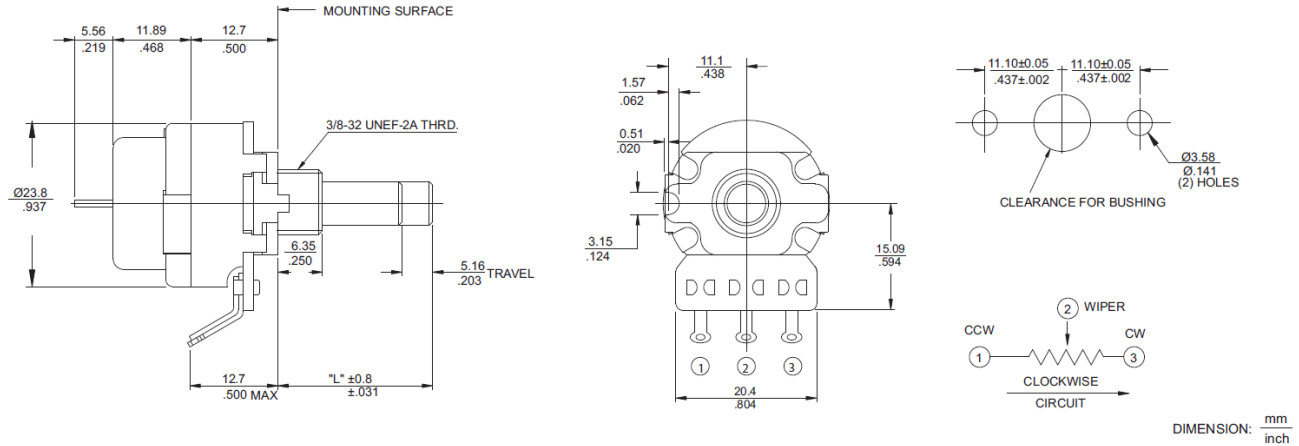


\* Consult CTS for its part no., or availability of more sections

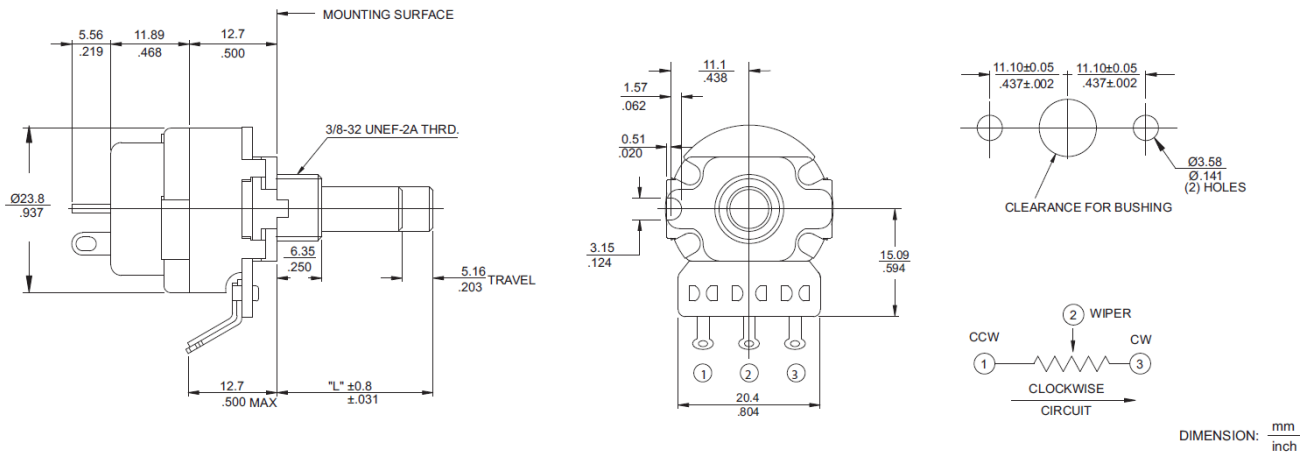
DIMENSION:  $\frac{mm}{inch}$

## Electrical and Mechanical Specifications

Series 450TM-x-G Molded Shaft, Bushing Mount, Solder Lug "T" Type Terminals, 040 Switch Option

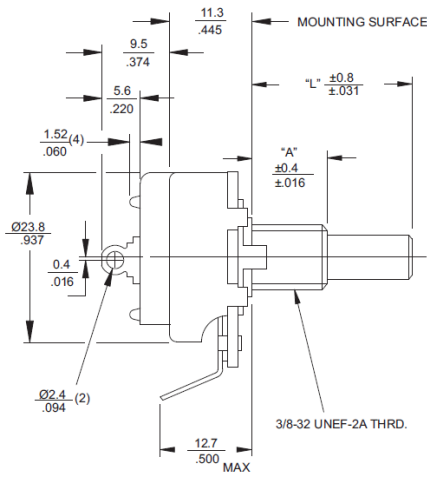


Series 450TM-x-H Molded Shaft, Bushing Mount, Solder Lug "T" Type Terminals, 041 Switch Option

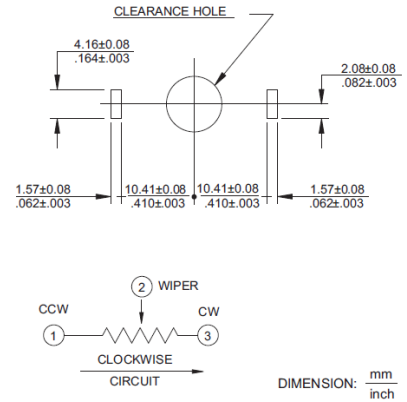
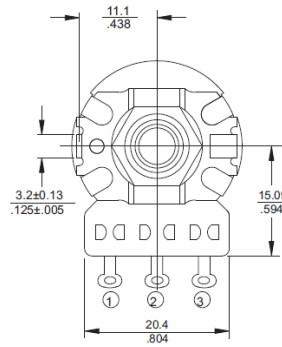


## Electrical and Mechanical Specifications

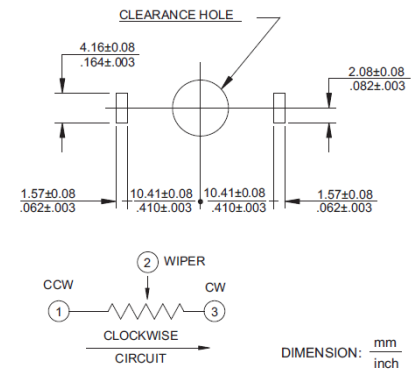
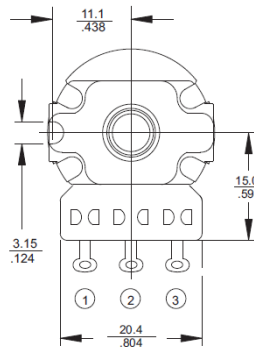
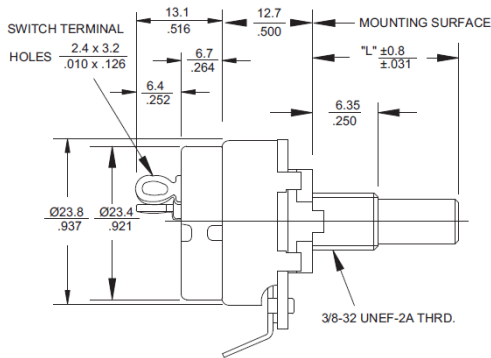
Series 450T-x-B Metal Shaft, Bushing Mount, Solder Lug "T" Type Terminals, 050 Switch Option



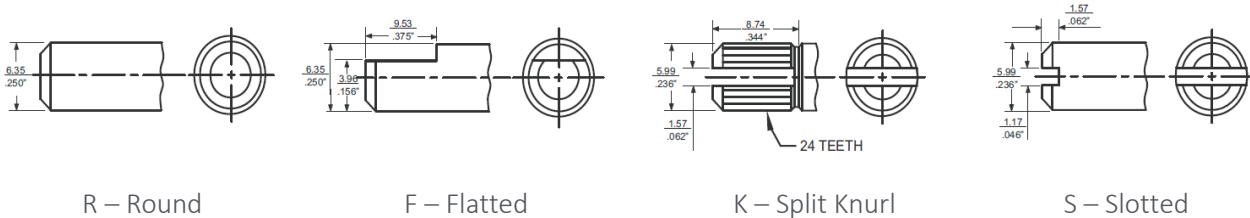
\* Refer to Ordering Information for switch details



Series 450TM-x-C Metal Shaft, Bushing Mount, Solder Lug "T" Type Terminals, TGC Switch Option



## Shaft Diameter and Trim Options



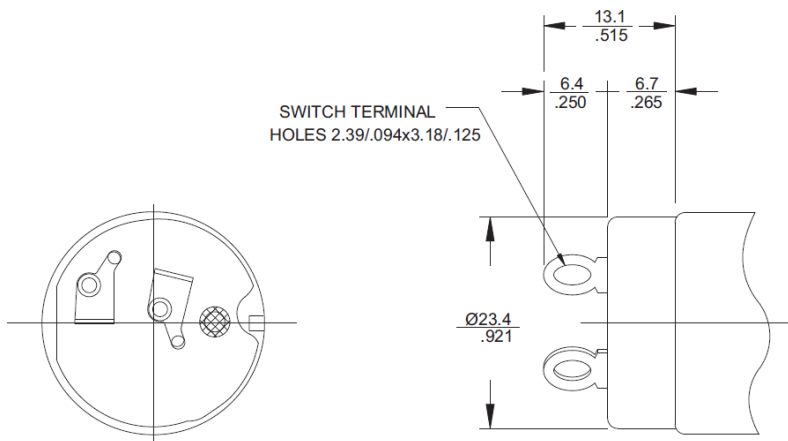
### Optional Power Switches

Series	Contact Arrangement	Electrical Rating	Outline Drawing
FR-GC	SPST Rotary	3 amps @ 125 volts, 1 amp @ 250 volts AC UL Recognized	
GC	SPST Rotary	5 amps @ 20 volts DC (Automotive)	
Actuating Angle – 20° Actuating Torque – 7 to 17 in. oz. (504 to 1225 gf-cm)			
DIMENSION: $\frac{\text{mm}}{\text{inch}}$			

TGC                      SPST  
                                 Rotary

6 amps @ 125 volts AC  
UL & CSA Recognized

Actuating Angle – 20°  
 Actuating Torque – 7 to 17 in. oz.  
 (504 to 1225 gf-cm)

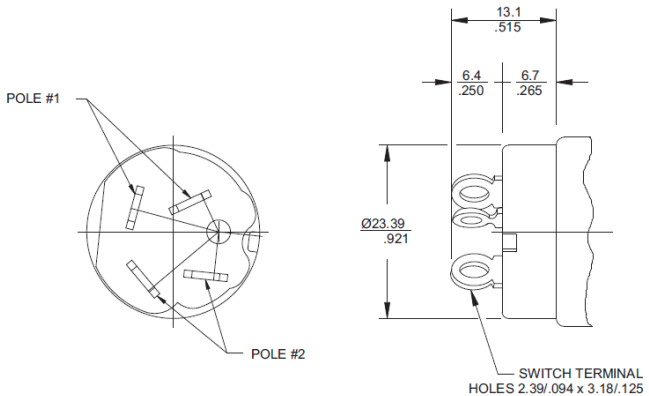
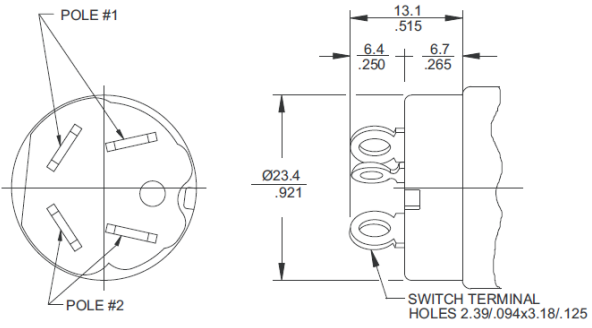
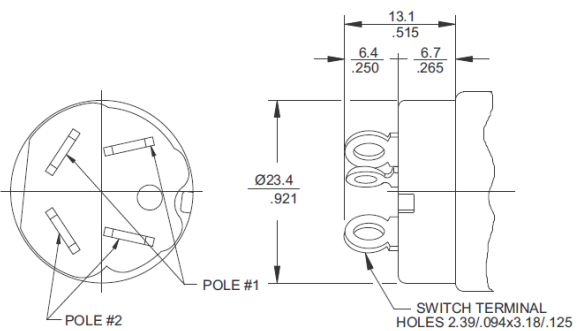


DIMENSION:  $\frac{\text{mm}}{\text{inch}}$

### Optional Power Switches

Series	Contact Arrangement	Electrical Rating	Outline Drawing
TV-023	SPST Rotary	TV-5 rating UL & CSA Recognized	
<p>Actuating Angle – 20° Actuating Torque – 10 to 20 in. oz. (720 to 1441 gf-cm)</p>			
<p>DIMENSION: <math>\frac{\text{mm}}{\text{inch}}</math></p>			
041	SPDT Push-on Push-off	6 amps @ 125 volts AC	
<p>Pre-travel 13/64" (5.2mm) Activating Force: 2 to 5 lb (0.9 to 2.3 kgf)</p>			
<p>DIMENSION: <math>\frac{\text{mm}}{\text{inch}}</math></p>			
050	SPST Rotary	3 amps @ 125 volts AC (Shallow construction switch) UL & CSA Recognized 7.5 amps @ 20 volts DC (Automotive)	
<p>Actuating Angle: 25° Actuating Torque: 2 to 15 in. oz. (144 to 1080 gf-cm)</p>			
<p>DIMENSION: <math>\frac{\text{mm}}{\text{inch}}</math></p>			

### Optional Power Switches

Series	Contact Arrangement	Electrical Rating	Outline Drawing
<b>FR-027</b>	<b>DPST</b> Rotary	3 amps @ 125 volts, 1 amp @ 250 volts AC UL Recognized	 <p>POLE #1</p> <p>POLE #2</p> <p>SWITCH TERMINAL HOLES 2.39/.094 x 3.18/.125</p> <p>Dimensions: 13.1 / .515, 6.4 / .250, 6.7 / .265, Ø23.39 / .921</p>
<p>Actuating Angle: 20°</p> <p>Actuating Torque: 10 to 20 in. oz. (720 to 1441 gf-cm)</p>			
<p>DIMENSION: <math>\frac{\text{mm}}{\text{inch}}</math></p>			
<b>TV-020</b>	<b>DPST</b> Rotary	125 volts AC Pole #1, TV-1 rating Pole #2, TV-3 rating UL & CSA Recognized	 <p>POLE #1</p> <p>POLE #2</p> <p>SWITCH TERMINAL HOLES 2.39/.094x3.18/.125</p> <p>Dimensions: 13.1 / .515, 6.4 / .250, 6.7 / .265, Ø23.4 / .921</p>
<p>Actuating Angle: 20°</p> <p>Actuating Torque: 10 to 20 in. oz. (720 to 1440 gf-cm)</p>			
<p>DIMENSION: <math>\frac{\text{mm}}{\text{inch}}</math></p>			
<b>TV-021</b>	<b>SPDT</b> Rotary	TV-4 rating UL Recognized	 <p>POLE #1</p> <p>POLE #2</p> <p>SWITCH TERMINAL HOLES 2.39/.094x3.18/.125</p> <p>Dimensions: 13.1 / .515, 6.4 / .250, 6.7 / .265, Ø23.4 / .921</p>
<p>Actuating Angle: 20°</p> <p>Actuating Torque: 10 to 20 in. oz. (720 to 1440 gf-cm)</p>			
<p>DIMENSION: <math>\frac{\text{mm}}{\text{inch}}</math></p>			

## Optional Power Switches

Series	Contact Arrangement	Electrical Rating	Outline Drawing
FR-028	<b>SPDT</b> Rotary	3 amps @ 125 volts AC UL Recognized	
	Actuating Angle: 20° Actuating Torque: 10 to 20 in. oz. (720 to 1440 gf-cm)		
			DIMENSION: $\frac{\text{mm}}{\text{inch}}$
FR-K	<b>SPST</b> Pull-on Push-off	3 amps @ 125 volts AC UL & CSA Recognized	
	Pre-travel: 5/32" (3.97mm) Actuating force: 7 to 16 oz. - Single section control (198 to 454 gf) 7 to 20 oz. - Tandem control (198 to 567 gf)		
			DIMENSION: $\frac{\text{mm}}{\text{inch}}$

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