



# Series 09VR

## 9mm Panel Potentiometer

- Miniature 9 mm package size
- Rotational life (5,000 cycles)
- Wide temperature range (-10°C to +70°C)
- Mechanical travel options (280° and 300°)
- Variety of standard resistances and tapers

### Applications

- Consumer portable electronics
- Commercial appliances
- Instrument amplifiers and guitar effects
- Keyboards and synthesizers
- Communications equipment



### Ordering Information

Series	Element	Terminal Configuration	Shaft Length	Shaft Trim	Mechanical Travel	Detent Option	Resistance Code	Resistance Taper																																						
09VR	1	M	20	F	2	N	103	B1																																						
		<table><tr><th>Code</th><th>Spec.</th></tr><tr><td>M</td><td>Horizontal/Side Mount Bushingless, PC Pins, 6.5mm Height</td></tr><tr><td>B</td><td>Horizontal/Side Mount Sleeve Bushing, PC Pins, 6.5mm Height</td></tr><tr><td>S</td><td>Horizontal/Side Mount Thread Bushing, PC Pins, 6.5mm Height</td></tr><tr><td>H</td><td>Vertical/Rear Mount Thread Bushing, PC Pins</td></tr><tr><td>K</td><td>Vertical/Rear Mount Sleeve Bushing, PC Pins</td></tr><tr><td>U</td><td>Vertical/Rear Mount Bushingless, PC Pins</td></tr></table>	Code	Spec.	M	Horizontal/Side Mount Bushingless, PC Pins, 6.5mm Height	B	Horizontal/Side Mount Sleeve Bushing, PC Pins, 6.5mm Height	S	Horizontal/Side Mount Thread Bushing, PC Pins, 6.5mm Height	H	Vertical/Rear Mount Thread Bushing, PC Pins	K	Vertical/Rear Mount Sleeve Bushing, PC Pins	U	Vertical/Rear Mount Bushingless, PC Pins		<table><tr><th>Code</th><th>Spec.</th></tr><tr><td>B</td><td>Knurled (18 teeth)</td></tr><tr><td>F</td><td>Flatted</td></tr><tr><td>L</td><td>Knurled (40 teeth)</td></tr></table>	Code	Spec.	B	Knurled (18 teeth)	F	Flatted	L	Knurled (40 teeth)		<table><tr><th>Code</th><th>Spec.</th></tr><tr><td>N</td><td>No Detent</td></tr><tr><td>C</td><td>Center Detent</td></tr></table>	Code	Spec.	N	No Detent	C	Center Detent		<table><tr><th>Code</th><th>Spec.**</th></tr><tr><td>A2</td><td>10% Log</td></tr><tr><td>A3</td><td>15% Log</td></tr><tr><td>B1</td><td>linear</td></tr><tr><td>C3</td><td>15% Antilog</td></tr></table>	Code	Spec.**	A2	10% Log	A3	15% Log	B1	linear	C3	15% Antilog
Code	Spec.																																													
M	Horizontal/Side Mount Bushingless, PC Pins, 6.5mm Height																																													
B	Horizontal/Side Mount Sleeve Bushing, PC Pins, 6.5mm Height																																													
S	Horizontal/Side Mount Thread Bushing, PC Pins, 6.5mm Height																																													
H	Vertical/Rear Mount Thread Bushing, PC Pins																																													
K	Vertical/Rear Mount Sleeve Bushing, PC Pins																																													
U	Vertical/Rear Mount Bushingless, PC Pins																																													
Code	Spec.																																													
B	Knurled (18 teeth)																																													
F	Flatted																																													
L	Knurled (40 teeth)																																													
Code	Spec.																																													
N	No Detent																																													
C	Center Detent																																													
Code	Spec.**																																													
A2	10% Log																																													
A3	15% Log																																													
B1	linear																																													
C3	15% Antilog																																													
					<table><tr><th>Code</th><th>Spec.</th></tr><tr><td>1</td><td>280°</td></tr><tr><td>2</td><td>300°</td></tr></table>	Code	Spec.	1	280°	2	300°		<table><tr><th>Code</th><th>Spec.</th></tr><tr><td>502</td><td>5kΩ</td></tr><tr><td>103</td><td>10kΩ</td></tr><tr><td>203</td><td>20kΩ</td></tr><tr><td>503</td><td>50kΩ</td></tr><tr><td>104</td><td>100kΩ</td></tr><tr><td>254</td><td>250kΩ</td></tr><tr><td>504</td><td>500kΩ</td></tr></table>	Code	Spec.	502	5kΩ	103	10kΩ	203	20kΩ	503	50kΩ	104	100kΩ	254	250kΩ	504	500kΩ																	
Code	Spec.																																													
1	280°																																													
2	300°																																													
Code	Spec.																																													
502	5kΩ																																													
103	10kΩ																																													
203	20kΩ																																													
503	50kΩ																																													
104	100kΩ																																													
254	250kΩ																																													
504	500kΩ																																													
	<table><tr><th>Code</th><th>Spec.</th></tr><tr><td>1</td><td>Single</td></tr></table>	Code	Spec.	1	Single	<table><tr><th>Code</th><th>Spec.*</th></tr><tr><td>15</td><td>15 mm</td></tr><tr><td>20</td><td>20 mm</td></tr><tr><td>25</td><td>25 mm</td></tr><tr><td>30</td><td>30 mm</td></tr></table>	Code	Spec.*	15	15 mm	20	20 mm	25	25 mm	30	30 mm																														
Code	Spec.																																													
1	Single																																													
Code	Spec.*																																													
15	15 mm																																													
20	20 mm																																													
25	25 mm																																													
30	30 mm																																													

\* See shaft trim options for available lengths.

\*\* Other JIS tapers are available. See charts.

## Electrical Specifications

	Min	Typical	Max	Unit
Total Resistance Tolerance	-20	–	+20	%
Power Rating	–	+0.05	–	watt
Operating Voltage	–	–	+20	VDC
Residual Resistance	–	+300	–	$\Omega$
Slider Noise	–	–	+100	mV
Insulation Resistance	250 VDC for 1 min.	+100		M $\Omega$
Dielectric Strength	250 VAC for 1 min. no arcing			
Taper	Linear and audio options (see charts)			

## Mechanical

Total Mechanical Travel	280° $\pm$ 5° 300° $\pm$ 5°
Operating Torque	10 to 80 gf-cm
Starting Torque	100 gf-cm max.
Shaft Wobble	
Bushingsless	0.8 x L/20mm p-p max.; L = Shaft Length
With Bushing	0.5 x L/20mm p-p max.; L = Shaft Length
Shaft Push-Pull Strength	5 kgf for 3 sec.
Stop Strength	3 kgf-cm min.
Detent Position	
280° travel	140° $\pm$ 5°
300° travel	150° $\pm$ 5°
Detent Torque	30 to 300 gf-cm
Rotational Life	5,000 cycles
Panel Nut Tightening Torque	6 kgf-cm
IP Rating	40
Mounting Hardware	One flat washer and one mounting hex nut supplied with bushing option
Packaging	Bulk
Weight	2 grams

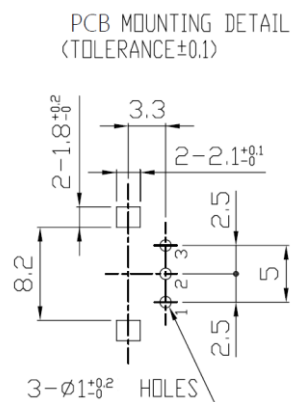
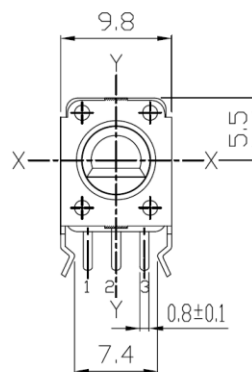
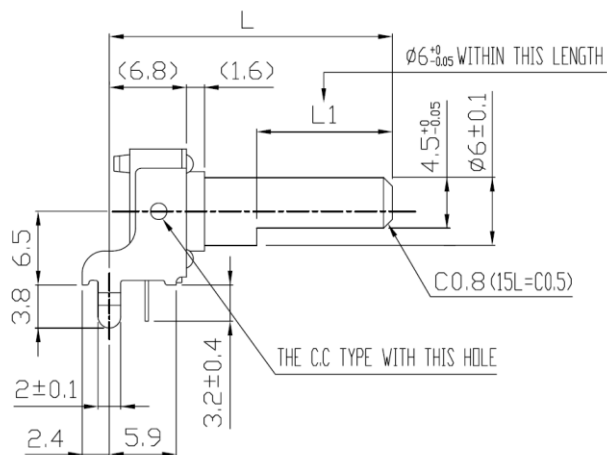
## Environmental

	Min	Typical	Max	Unit
Operating Temperature	-10	–	+70	°C
Storage Temperature	-30	–	+70	°C
Soldering Conditions				
Wave Solder	Preheat: 100°C max for 2 min max; Solder temperature: 260°C $\pm$ 5°C for 5 sec max.; No clean foam flux recommended			
Manual Solder	350°C $\pm$ 5°C for 3 sec max.; Sn95Ag5 no clean solder			
Wash	Not recommended			
Moisture Sensitivity Level	1			
ESD Classification (HBM)	Not applicable			

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.

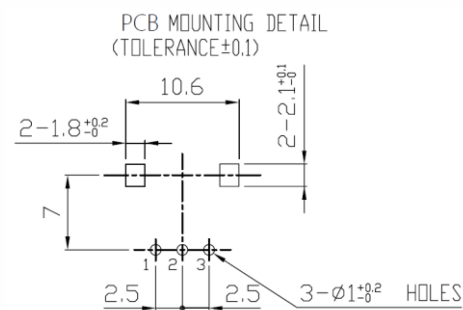
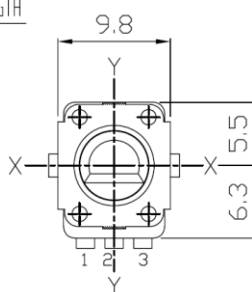
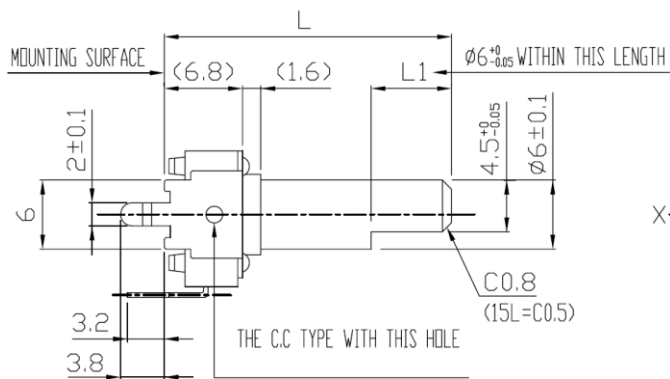
## Mechanical Specifications

## Series 09VR Horizontal/Side Mount Bushingless

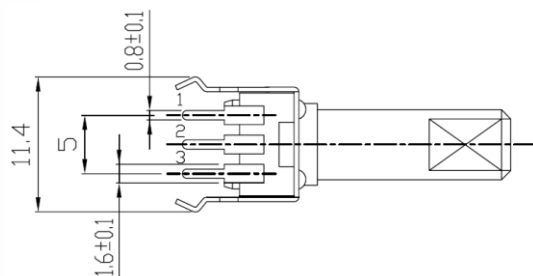


SHAFT SHOWN IN CENTER POSITION  
OR CENTER CLICK POSITION

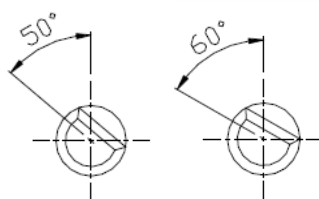
## Series 09VR Vertical/Rear Mount Bushingless



SHAFT SHOWN IN CENTER POSITION  
OR CENTER CLICK POSITION



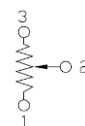
Unit: mm



280° ROTATION      300° ROTATION

SHAFT SHOWN IN FULL CCW POSITION

CIRCUIT DIAGRAM

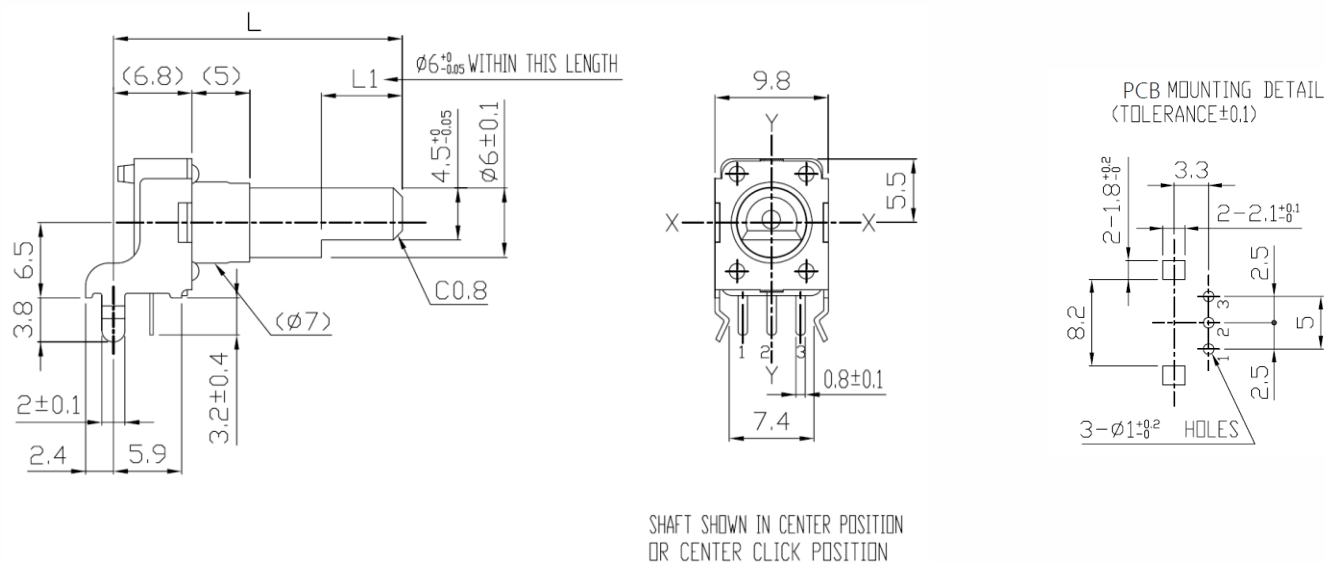


LENGTH	
L	L1
15	6
20	7
25	12
30	12

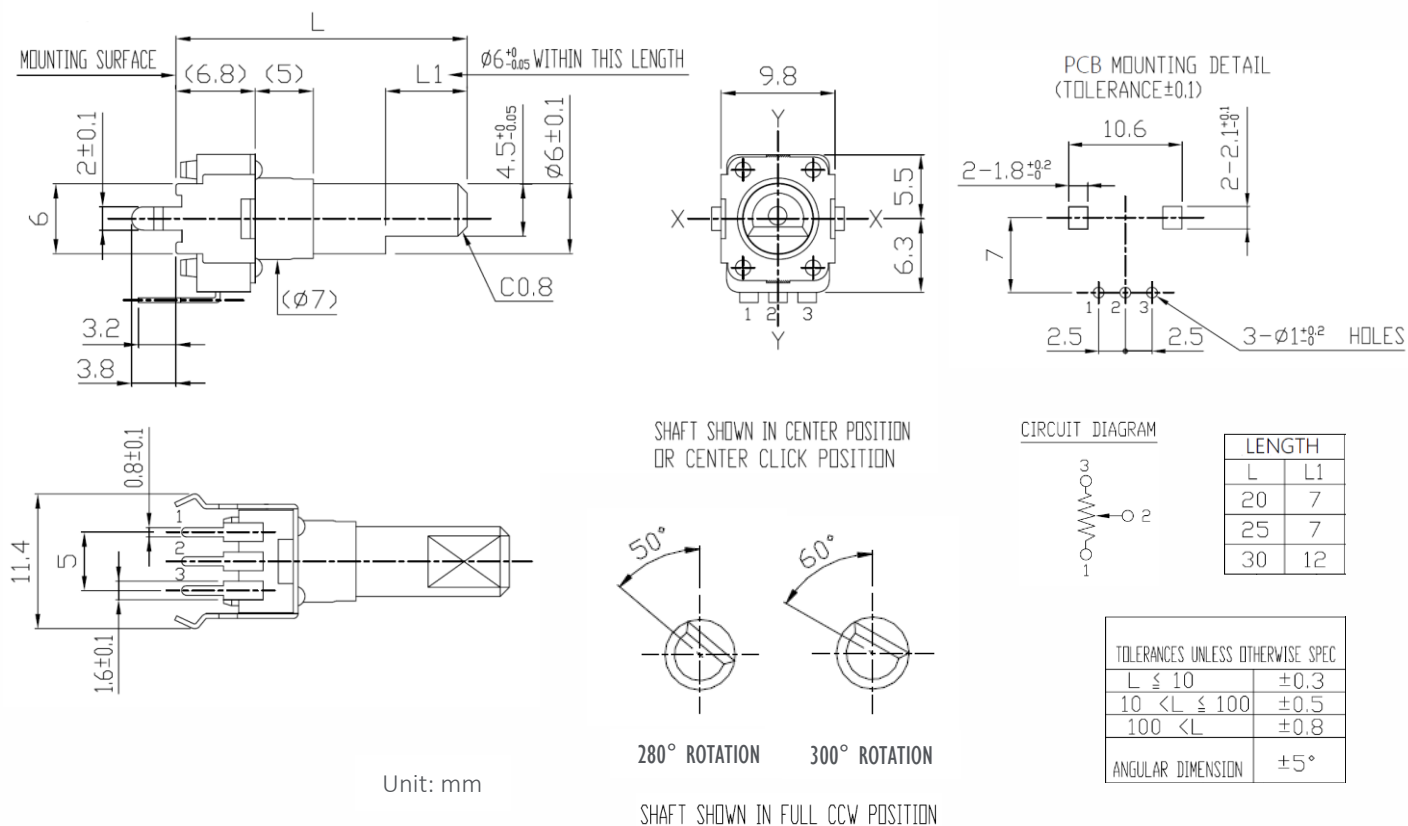
TOLERANCES UNLESS OTHERWISE SPECIFIED	
$L \leq 10$	$\pm 0.3$
$10 < L \leq 100$	$\pm 0.5$
$100 < L$	$\pm 0.8$
ANGULAR DIMENSION	$\pm 5^\circ$

## Mechanical Specifications

### Series 09VR Horizontal/Side Mount Sleeve Bushing

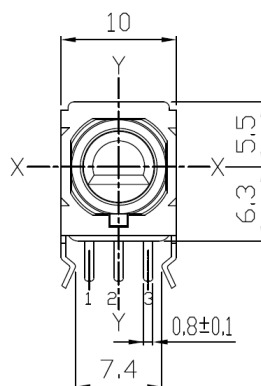
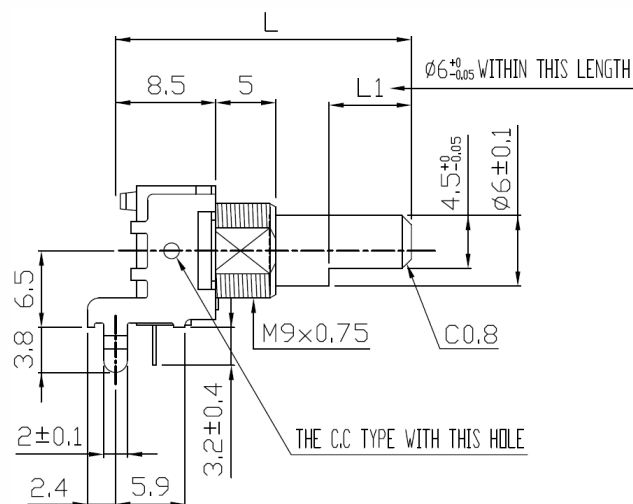


### Series 09VR Vertical/Rear Mount Sleeve Bushing

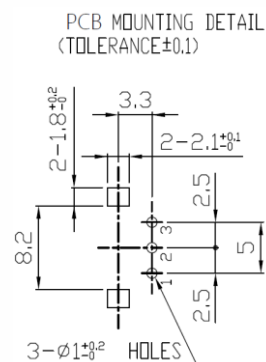


## Mechanical Specifications

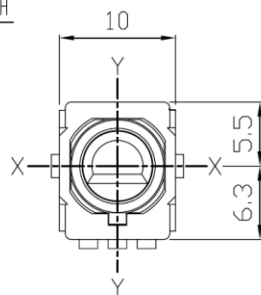
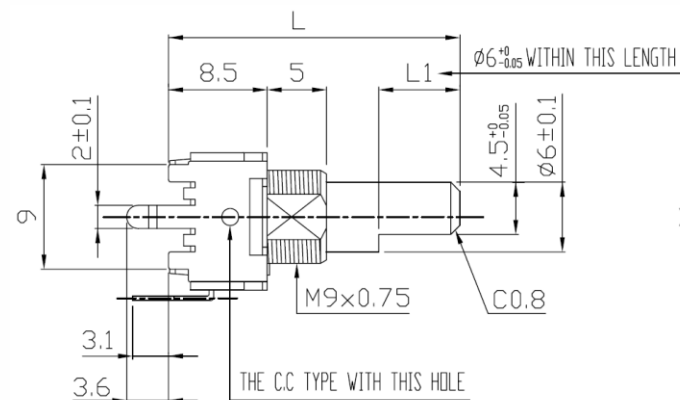
### Series 09VR Horizontal/Side Mount with Threaded Bushing



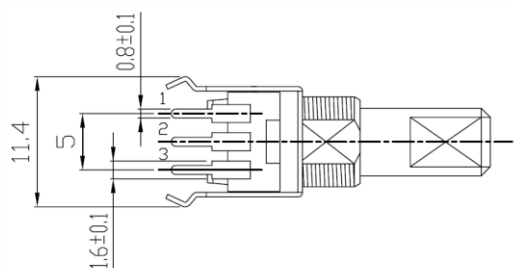
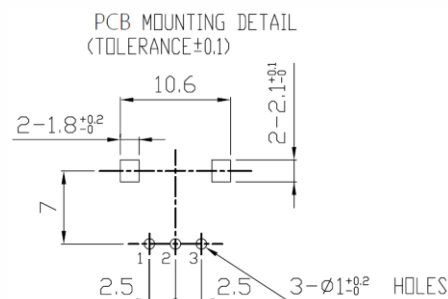
SHAFT SHOWN IN CENTER POSITION  
OR CENTER CLICK POSITION



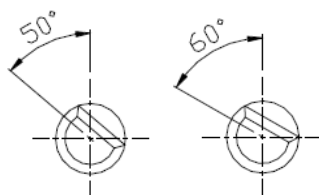
### Series 09VR Vertical/Rear Mount with Threaded Bushing



SHAFT SHOWN IN CENTER POSITION  
OR CENTER CLICK POSITION



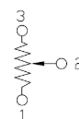
Unit: mm



280° ROTATION 300° ROTATION

SHAFT SHOWN IN FULL CCW POSITION

#### CIRCUIT DIAGRAM

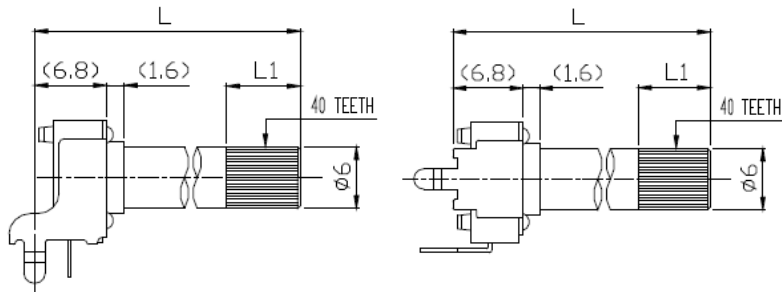


LENGTH	
L	L1
25	7
30	12

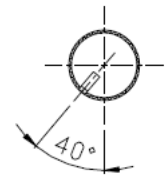
TOLERANCES UNLESS OTHERWISE SPEC	
$L \leq 10$	$\pm 0.3$
$10 < L \leq 100$	$\pm 0.5$
$100 < L$	$\pm 0.8$
ANGULAR DIMENSION	$\pm 5^\circ$

## Mechanical Specifications

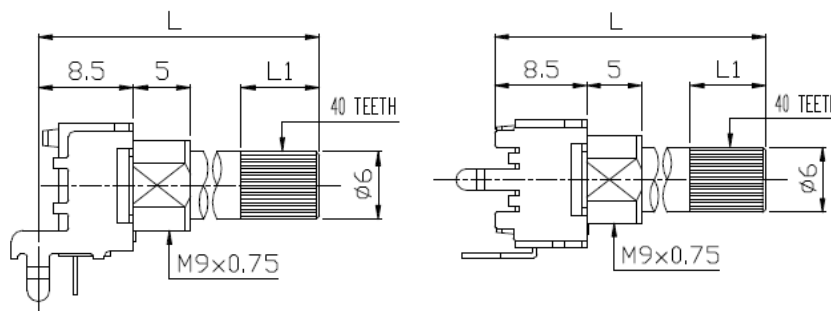
### 40 Tooth Knurl Shaft Trim Option



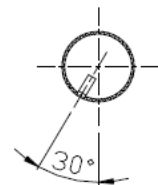
LENGTH	
L	L1
15	6
20	7
25	7
30	7



280° ROTATION



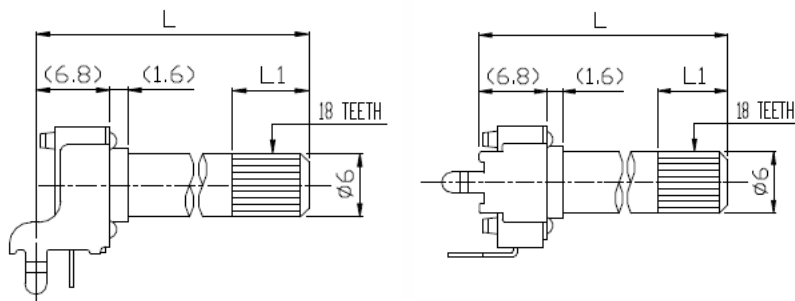
LENGTH	
L	L1
25	7
30	7



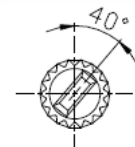
300° ROTATION

SHAFT SHOWN IN FULL CCW POSITION

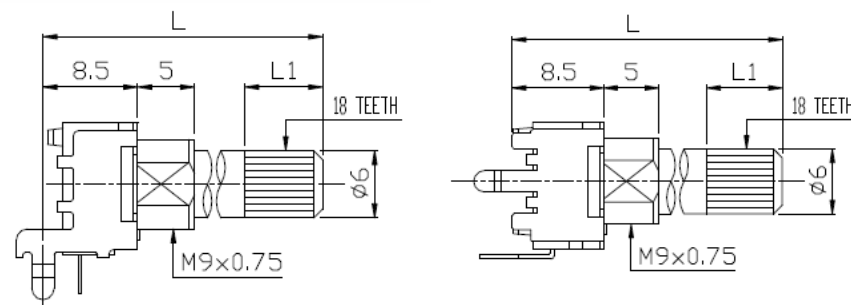
### 18 Tooth Knurl Shaft Trim Option



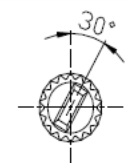
LENGTH	
L	L1
20	7
25	7



280° ROTATION



LENGTH	
L	L1
25	7



300° ROTATION

Unit: mm

SHAFT SHOWN IN FULL CCW POSITION



## Electrical Specification

### Series 09VR Taper Graphs

