

Panel Potentiometer

Model P09x Series



Features:

- Multi-ganged—up to 6 gangs
- Excellent 100,000 cycles life
- Rotary and Momentary Switch options
- Push-lock options
- Concentric shaft option
- Center tap option
- PCB pins

Description:

9mm Rotary Potentiometer, with metal shaft and bushing. Options include audio and linear tapers; knurled, flatted and slotted shafts.

Applications:

- Audio / video equipment / Amplifiers / Mixers
- TV and multimedia sound systems / Portable electronics

Model Styles Available:

- Side Adjust, 1 to 6 gangs P09xN
- Side Adjust, 1 to 4 gangs, w/Rotary switch P09xS
- Side Adjust, 1 to 4 gangs, w/Momentary switch P09xM
- Side Adjust, 1 gang, w/ Rotary and Momentary switches P091B
- Top Adjust, 1 or 2 gangs P09x5N
- Top Adjust, 1 gang w/Rotary switch P0915S
- Side Adjust, with Push-Lock, 1 or 2 gangs P09xP
- With Concentric shaft, 2 to 4 gangs P09xC
- With Center Tap, 2 gangs only P092T

Electrical Characteristics

$T_A = 25^\circ\text{C}$ unless otherwise noted

Resistance Range	1K Ω to 1M Ω
Standard Resistance Tolerance	$\pm 20\%$
Residual Resistance	20 ohms max
Resistance Taper	Audio (10A, 15A, 15C), Linear (1B) - see note 3
Maximum Operating Voltage	50Vac
Rated Power	Linear Taper B: 0.05W Other Tapers: 0.025W
Dielectric Strength	300 Vac , 1 minute
Rotational Noise	100mV max
Insulation Resistance	>100M ohms at 250 Vdc
Gang Error (Multi-ganged)	-40dB to 0dB, $\pm 3\text{dB}$

General Note

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Rotary Switch Characteristics

T_A = 25°C unless otherwise noted

Switch Circuit	SPST
Contact Resistance	<100mohms
Rated Power	3.0A at 16Vdc
Switch Torque	100-350 gf.cm
Switch Rotational Angle	50° Max.
Switch Life	15,000 cycles min.

Momentary Switch Characteristics

T_A = 25°C unless otherwise noted

Switch Circuit	SPST
Contact Resistance	<100mohms
Rated Power	0.5A at 12Vdc
Switch Torque	250-550 gf.cm
Switch Push Stroke Length	0.5 +0.5/-0.3 mm
Switch Life	15,000 cycles min.

Mechanical Characteristics

T_A = 25°C unless otherwise noted

Mechanical Travel (Rotational angle)	300° ± 10°
Rotational Torque	35 to 90 gf.cm
Rotational Stop Strength, Minimum	3.0kgf.cm
Shaft Pull Strength, Minimum	6.0 kgf
Detent Torque	50 to 200 gf.cm
Nut Tightening Strength, Minimum	8.0 kgf
Rotational Life	100,000 cycles

Environmental Characteristics

T_A = 25°C unless otherwise noted

Operating Temperature	-10°C to 70°C
IP Rating	IP50
Soldering Condition	Compatible with Industry standard soldering processes: Manual: SAC 270 °C max. for 3 seconds. Wave: SAC 260 °C max. for 5 seconds.
RoHS	Please refer to TT Electronics Website
REACH	Please refer to TT Electronics Website

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Panel Potentiometer

Model P09x Series



Ordering Information

P09	1		N	-		E	A	20	B	R	10K
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Part Family

9mm Rotary

Number of Gangs

x = x gangs

1 = single gang

to

6 = 6 gangs (maximum)

Model Style

Omit = Side Adjust

5 = Top Adjust (1 - 2 gang)

Switch type

N = No switch

S = Rotary switch

M = Momentary switch

B = Rotary & Momentary switch (1 gang only)

P = Push-Lock (1 - 2 gang)

C = Concentric Shaft (2 - 4 gang)

T = Center Tap (2 gang only)

Number of Detents

Omit = No detent

1 = Center only

2 = 11

3 = 21

4 = 41

Shaft Type

E = Slotted

F = Flatted

Q = Split knurled

Total Resistance

See Resistance table below

Resistance Taper

A = Audio (15A)

B = Linear (1B)

C = Rev. Audio (15C)

D = Audio (10A)

(see Note 2)

Shaft Length - L

10 = 10mm

15 = 15mm

17 = 17.5mm

20 = 20mm

25 = 25mm

30 = 30mm

35 = 35mm

(See Outline Drawings)

Full CCW Position

A = 300°

B = 120°

C = 30°

D = 210°

(see Note 1)

Resistance table

Resistance (Ohms)	1,000	2,000	5,000	10,000	20,000	50,000	100,000	200,000	500,000	1,000,000
Code	1K	2K	5K	10K	20K	50K	100K	200K	500K	1MEG

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Panel Potentiometer

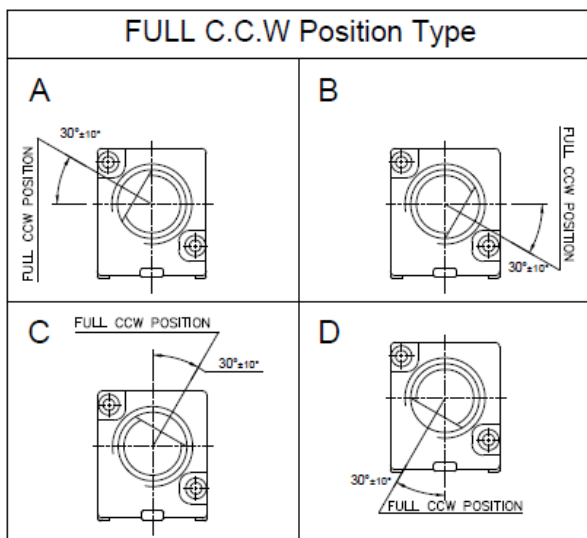
Model P09x Series



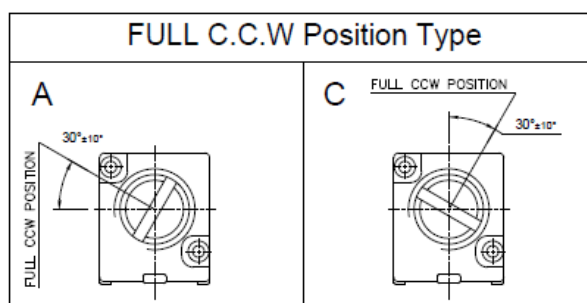
Note 1: Shaft Position

Models: P09xN, P09xS, P09xM, P091B, P09x5N, P0915S, P09xP, P09xT

F Shaft Type

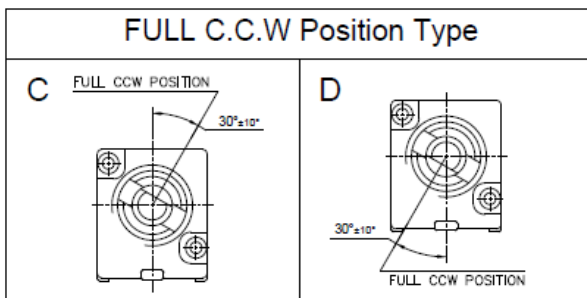


E /Q Shaft Type

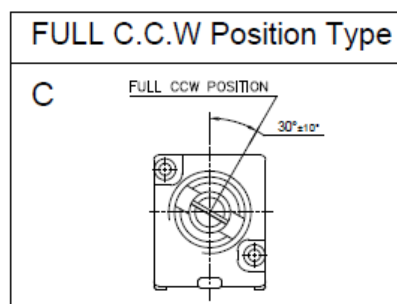


Models: P09xC

F Shaft Type



E /Q Shaft Type



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X = Number of Gangs

E-TYPE

F-TYPE

Q-TYPE

L	10	15	20	25	30
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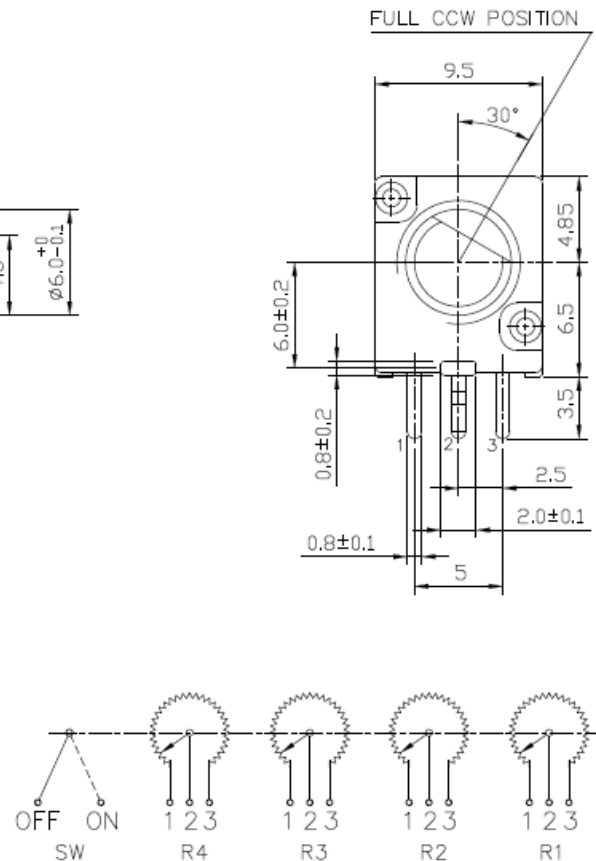
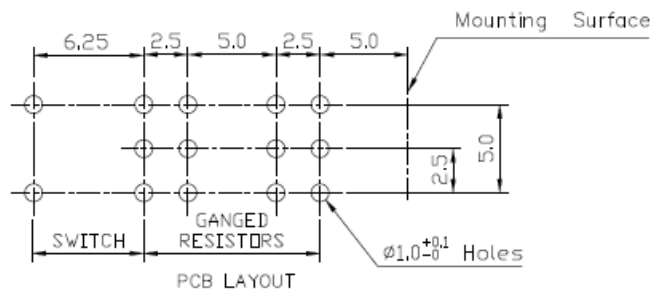
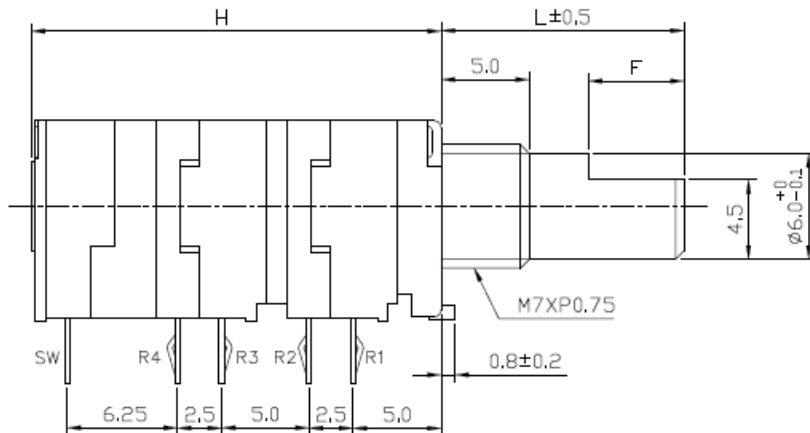
L	10	15	20	25	30
F	4	7	12	12	12

L	10	15	20	25	30
P	4	7	13	14	14
T	4	6	12	12	12
M	1	1	2	2	4

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Model P09xS (Side Adjust, PCB pins, up to 4 gangs with Rotary Switch)

X	1	2	3	4
H	13.3	15.8	20.8	23.3



E-TYPE

L	10	15	20	25	30
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F-TYPE

L	10	15	20	25	30
F	4	7	12	12	12

Q-TYPE

L	10	15	20	25	30
P	4	7	13	14	14
T	4	6	12	12	12
M	1	1	2	2	4

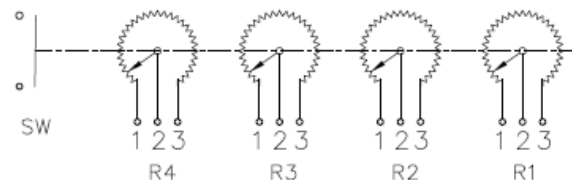
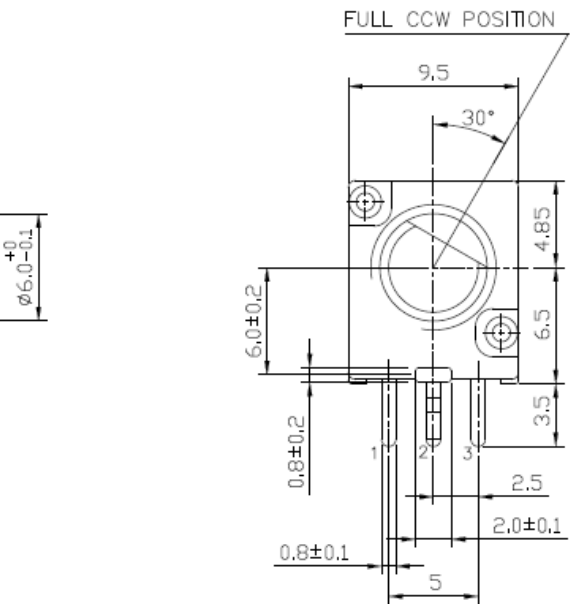
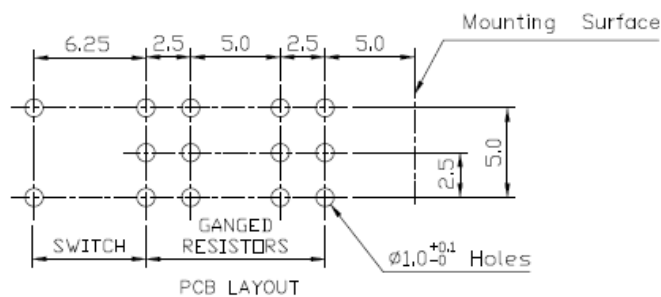
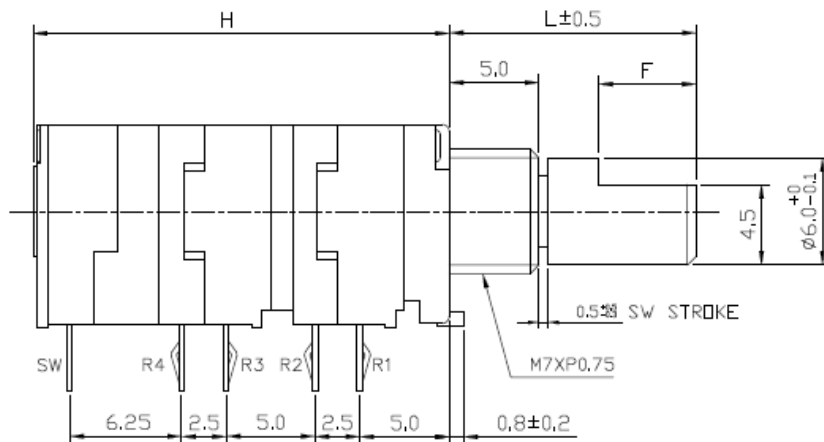
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Outline Drawings

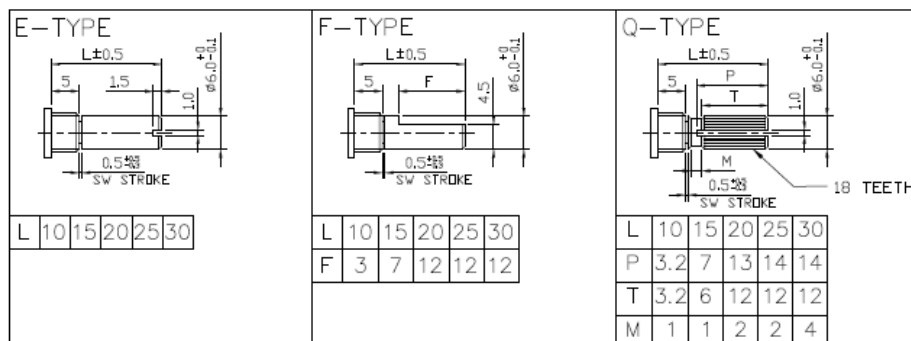
Model P09xM (Side Adjust, PCB pins, up to 4 gangs with Momentary Switch)

$$X = \text{Number of Gangs} + 1 \text{ Switch}$$

X	1	2	3	4
H	13.3	15.8	20.8	23.3



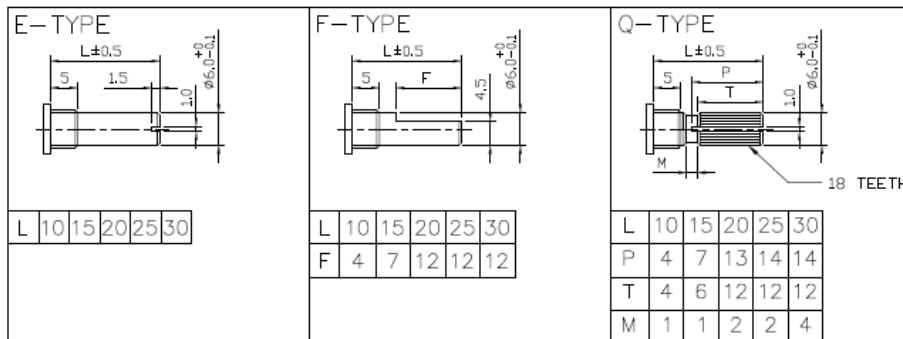
CIRCUIT DIAGRAM



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Model P0915N (Top Adjust, PCB pins, 1 gang)



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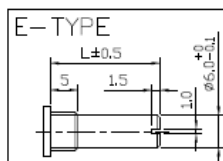
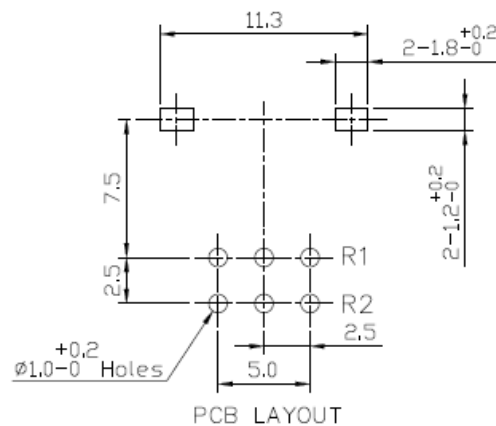
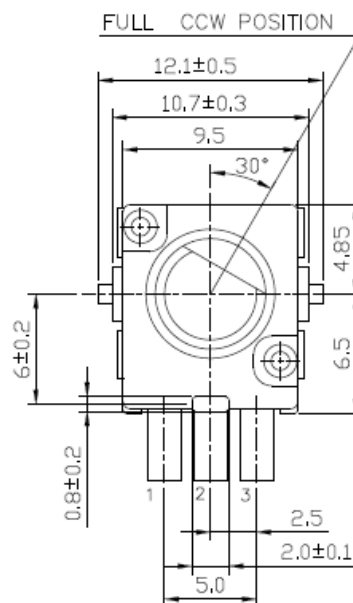
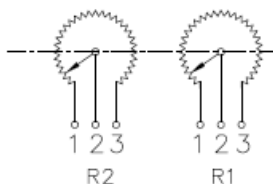
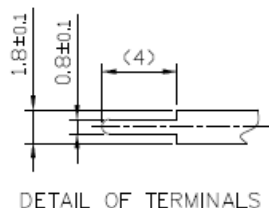
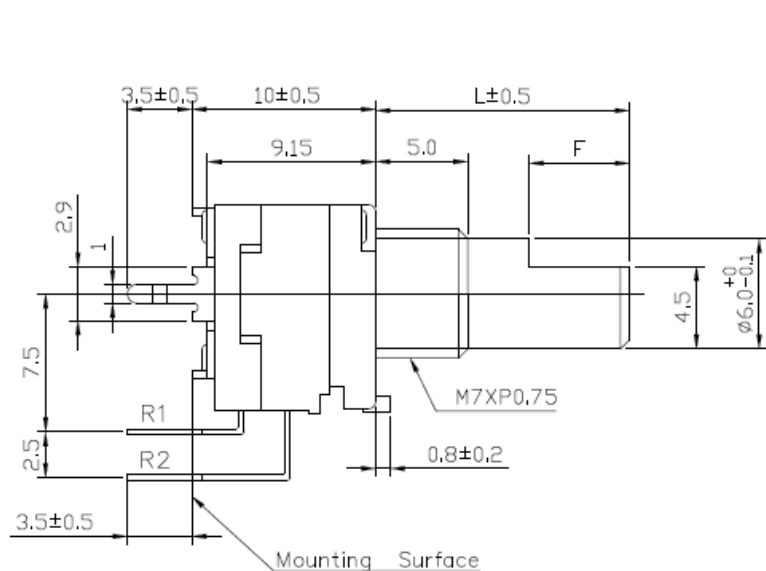
Panel Potentiometer

Model P09x Series

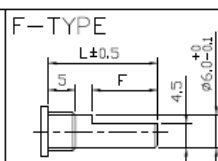


Outline Drawings

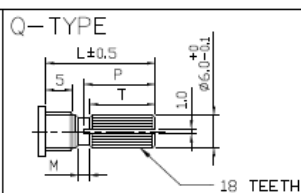
Model P0925N (Top Adjust, PCB pins, 2 gangs)



L	10	15	20	25	30
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L	10	15	20	25	30
F	4	7	12	12	12



L	10	15	20	25	30
P	4	7	13	14	14
T	4	6	12	12	12
M	1	1	2	2	4

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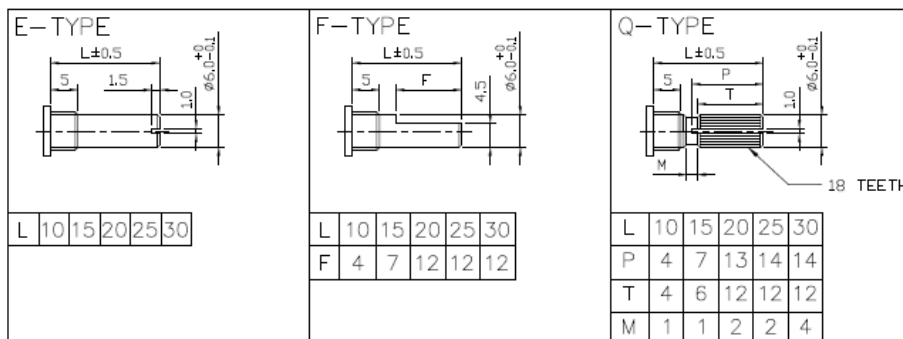
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Model P0915S (Top Adjust, PCB pins, with Rotary Switch, 1 gang only)



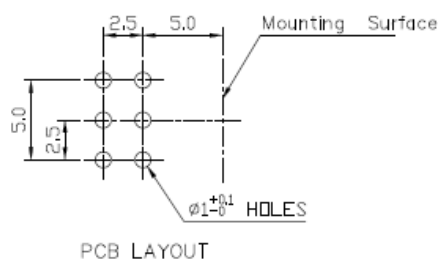
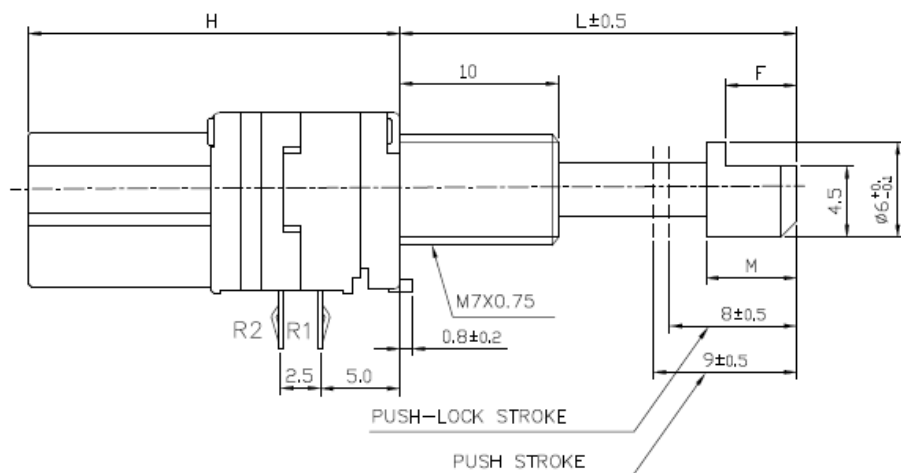
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Outline Drawings

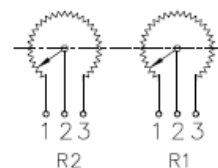
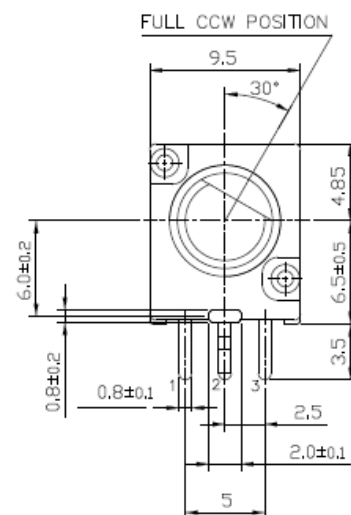
Model P09xP (Side Adjust, PCB pins, with Push-Lock, up to 2 gangs)

X = Number of Gangs

X	1	2
H	20.75	23.25



PCB LAYOUT



CIRCUIT DIAGRAM

E-TYPE

Technical drawing of E-TYPE push-rod assembly. Dimensions include: $L \pm 0.5$, 10, 1.5, 1.0, $\phi 6.0 \pm 0.1$, 9 ± 0.5 , and M . Labels: PUSH-LOCK STROKE, PUSH STROKE.

L	25	30	35
M	5.7	10.7	15.7

F-TYPE

Technical drawing of F-TYPE push-rod assembly. Dimensions include: $L \pm 0.5$, 10, 4.5, 1.5, $\phi 6.0 \pm 0.1$, 9 ± 0.5 , and M . Labels: PUSH-LOCK STROKE, PUSH STROKE.

L	25	30	35
F	4.5	7	12
M	5.7	10.7	15.7

Q-TYPE

Technical drawing of Q-TYPE push-rod assembly. Dimensions include: $L \pm 0.5$, 10, 4.5, 1.5, $\phi 6.0 \pm 0.1$, 9 ± 0.5 , and M . Labels: PUSH-LOCK STROKE, PUSH STROKE, 18 TEETH.

L	25	30	35
P	4	7	13
T	3	6	12
M	5.7	10.7	15.7

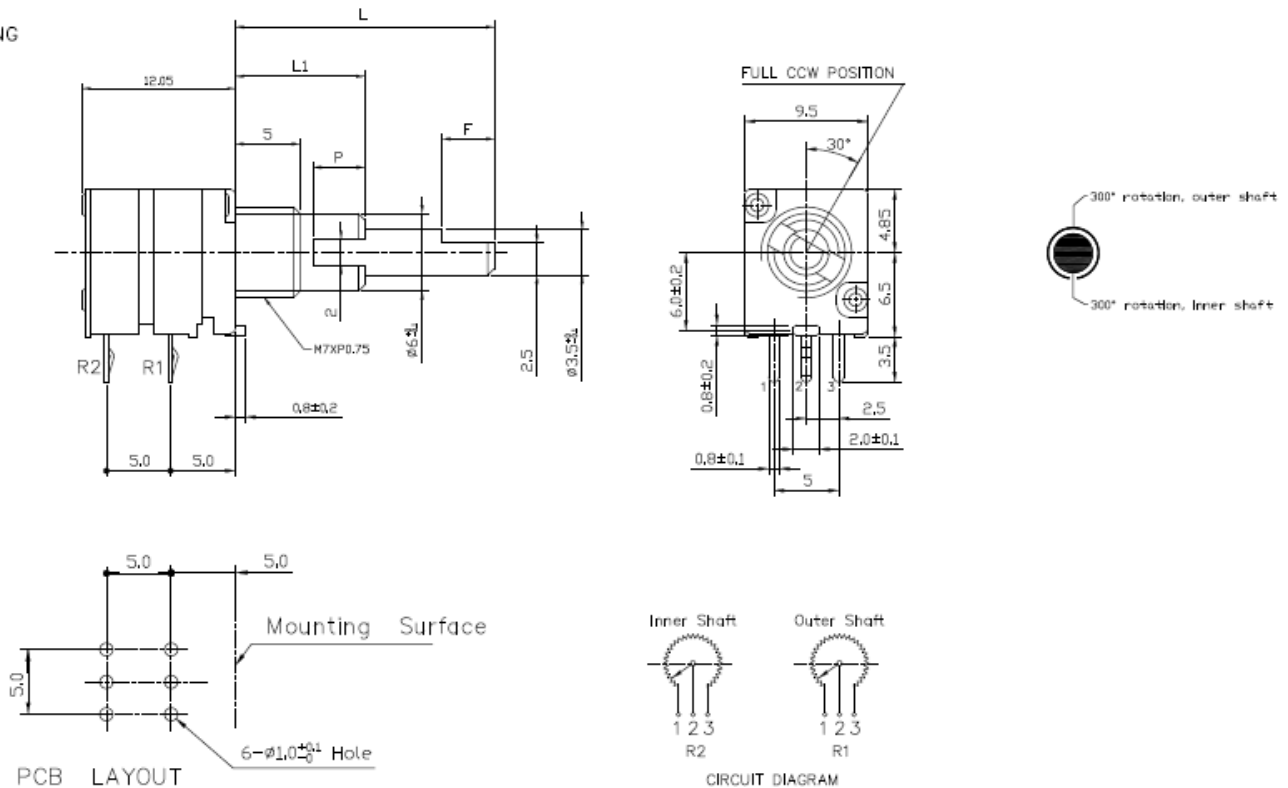
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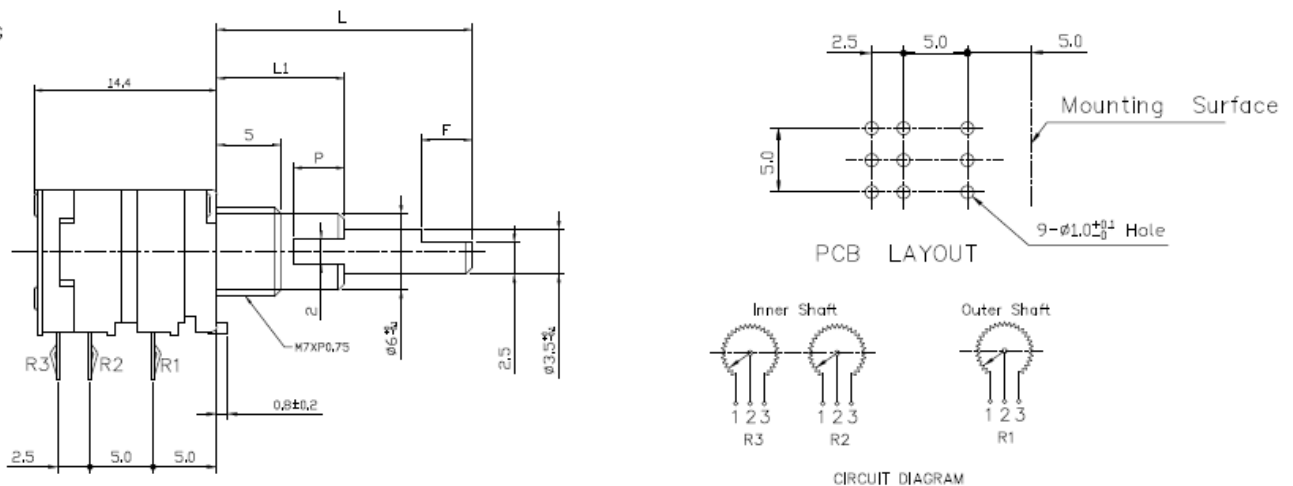
Outline Drawings

Model P09xC (Side Adjust, PCB pins with Concentric Shaft, 2 to 4 gangs)

2 GANG



3 GANG



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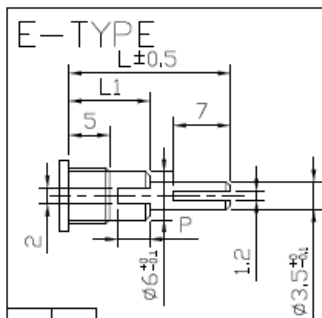
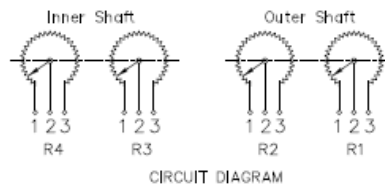
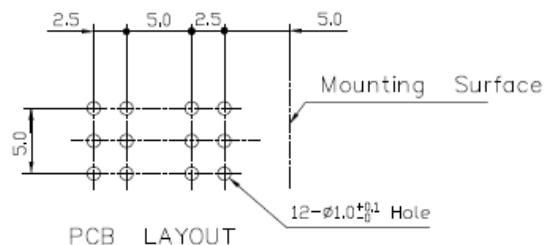
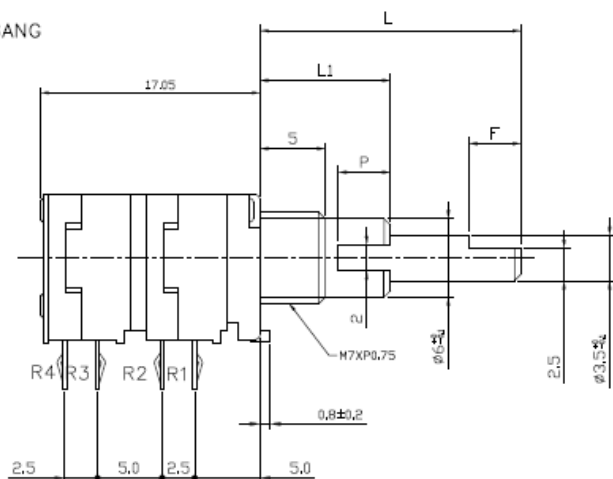
Model P09x Series



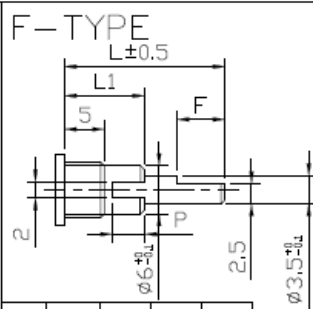
Outline Drawings

Model P09xC (Side Adjust, PCB pins with Concentric Shaft, 2 to 4 gangs), continued

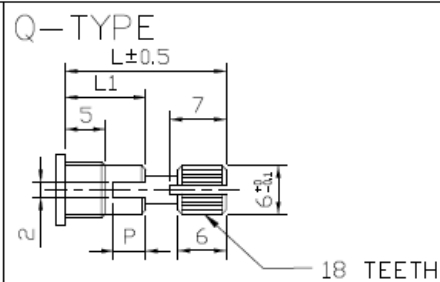
4 GANG



L	20
L1	10
P	4



L	15	17	20	25
L1	10	10	10	15
F	5	5	6	7
P	4	4	4	5



L	20
L1	10
P	4

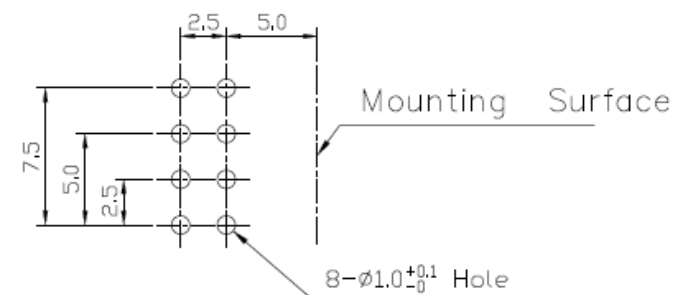
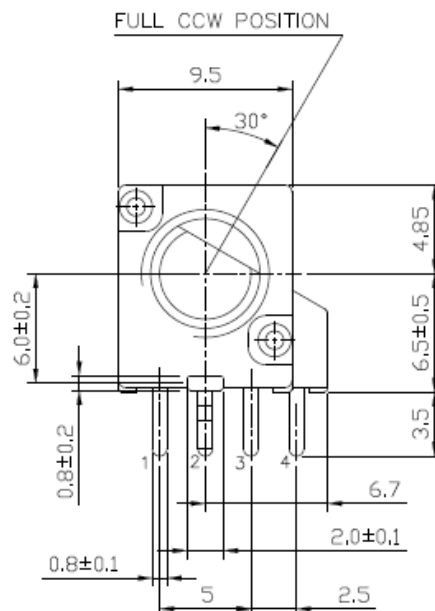
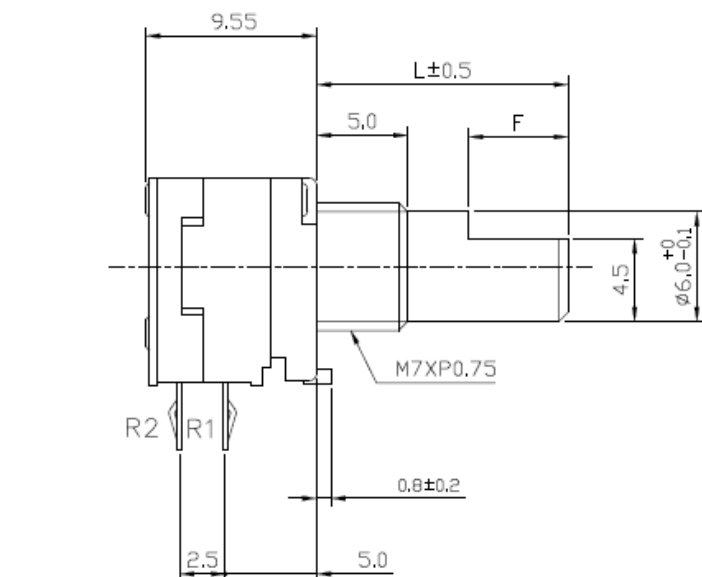
Note: L = 17 is 17.5mm

General Note

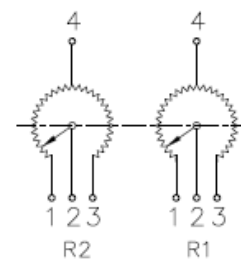
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Outline Drawings

Model P092T (Side Adjust, PCB pins, with Center Tap, 2 gangs only)



PCB LAYOUT



CIRCUIT DIAGRAM

E-TYPE

Technical drawing of E-TYPE potentiometer showing dimensions: $L \pm 0.5$, 5, 1.5, 1.0, and a hole diameter of $\varnothing 6.0 - 0.1$ with a $+0.2$ tolerance.

L	10	15	20	25	30
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F-TYPE

Technical drawing of F-TYPE potentiometer showing dimensions: $L \pm 0.5$, 5, F, 4.5, and a hole diameter of $\varnothing 6.0 - 0.1$ with a $+0.2$ tolerance.

L	10	15	20	25	30
F	4	7	12	12	12

Q-TYPE

Technical drawing of Q-TYPE potentiometer showing dimensions: $L \pm 0.5$, 5, P, T, 1.0, and a hole diameter of $\varnothing 6.0 - 0.1$ with a $+0.2$ tolerance. It also indicates 18 TEETH.

L	10	15	20	25	30
P	4	7	13	14	14
T	4	6	12	12	12
M	1	1	2	2	4

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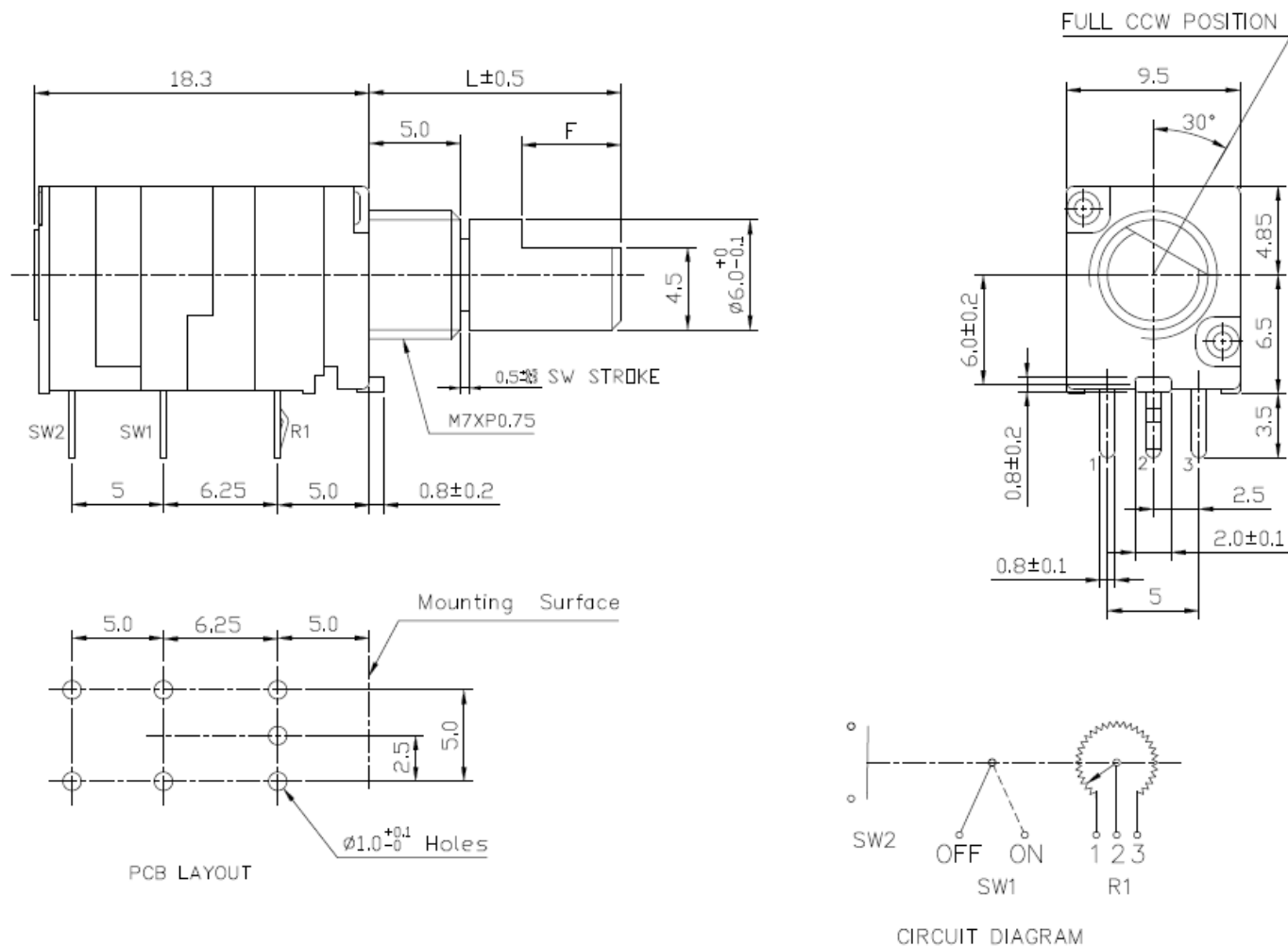
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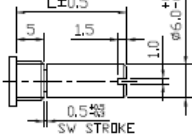
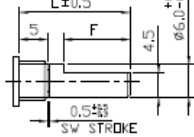
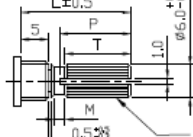
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Outline Drawings

Model P091B (Side Adjust, PCB pins, with Rotary and Momentary Switches, 1 gang only)

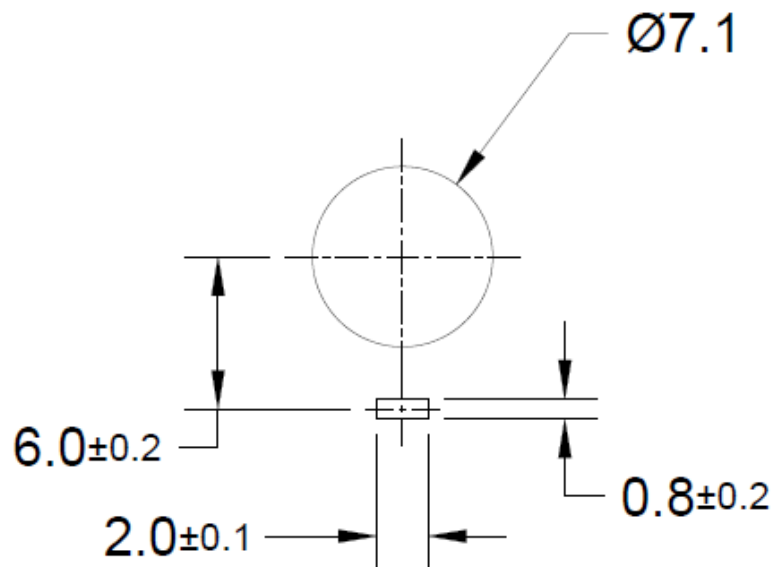


E-TYPE						F-TYPE						Q-TYPE					
																	
L	10	15	20	25	30	L	10	15	20	25	30	L	10	15	20	25	30
						F	3	7	12	12	12	P	3.2	7	13	14	14
												T	3.2	6	12	12	12
												M	1	1	2	2	4

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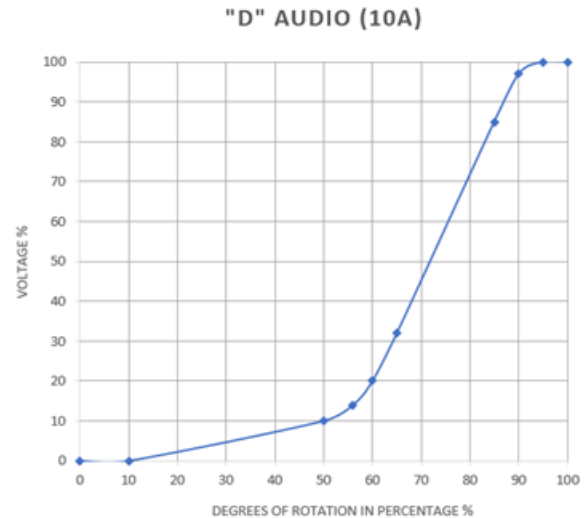
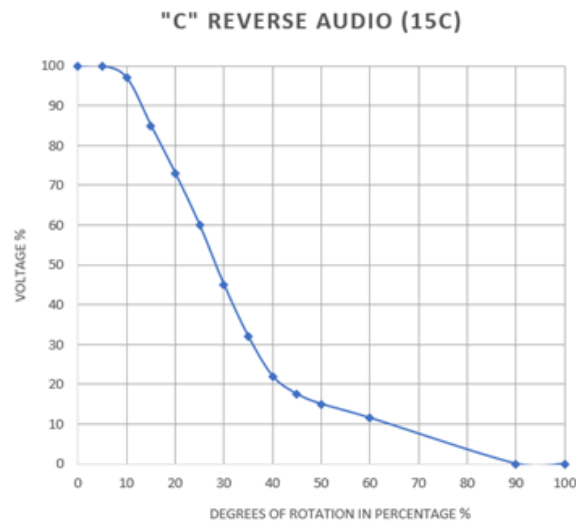
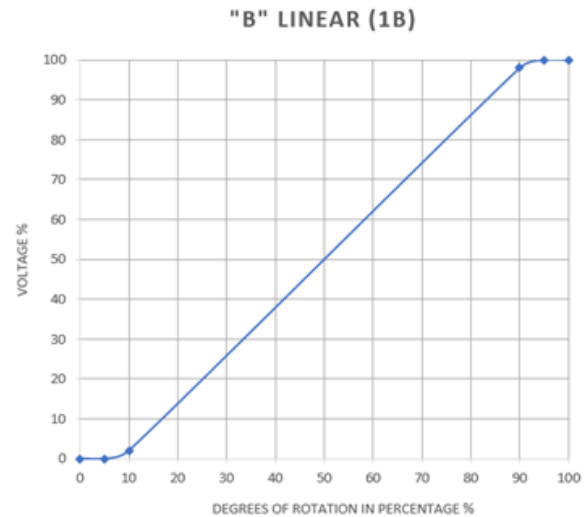
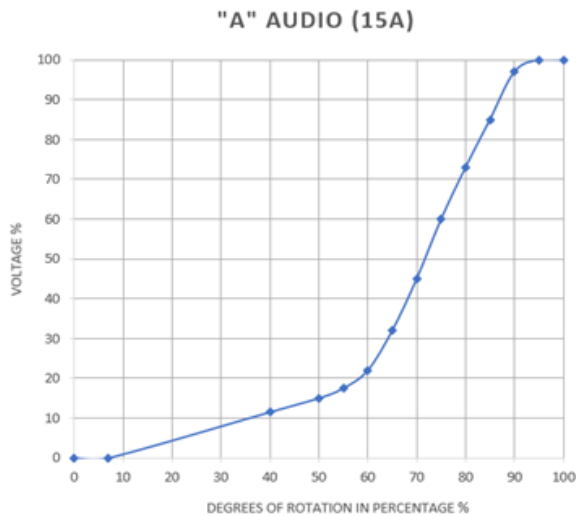
Panel Layout



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Note 2: Standard Tapers



Packaging

Standard Packaging	Plastic Trays
Hardware	Two flat washers and mounting nut

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