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■ Caution of Potentiometer Usage 電位器使用注意事項

1. Use of Chemicals 慣用化學品

Synthetic resins such as polycarbonate are used in the potentiometer. therefore, Care must be taken not expose the resistor to thick atmosphere of ammonia, amins, alkali solution , aromatic hydrocarbon, ketenes, esters, halogeneous hydrocarbon, ketenes esters, halogeneous hydrocarbons, etc.

電位器因使用諸如聚碳酸酯等合成樹脂，所以應避免將電位器暴露于氨、胺、碱溶液、芳烃、酮、酯、鹵烃等化學物品濃烈氣氛中。

2. Use of Flux 慎用助焊劑

When soldering, avoid using water-soluble flux, othrewise, it might cause and adverse effect on molding material and metal.

焊錫時應避免使用水溶性助焊劑，否則將會對電位器的金屬和其他材料產生不良影響。

3. Soldering 焊錫

Avoid employing wiring designs and soldering methods in which molten solder flows over the upper surface of PC board, as illustrated in the schematic drawing. This could cause occurrences of imperfect contacts.

布線設計和焊錫方法應避免導致 (如圖 1) 所示，熔錫流到 PC 板上平面，這樣會引起接觸不良。

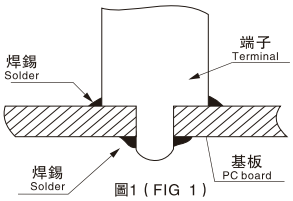


圖1 (FIG 1)

4. Recommended Circuit Configuration 推薦的電路接法

When using variable resistors, it is recommended that implement the product as voltage divider. The load resistance R_L , of potentiometer should not less than 10 times of nominal resistance R_T , as shown in Fig 2.

In applications where a direct current is allowed to flow through the potentiometer's sliding arm, there could be a problem of anodic oxidation due to an unusual increase in resistance value.In this case, it is recommended that connecting the negative line to the resistance element and the positive line to the sliding arm. as shown in fig 3.

電位器作為可變電阻使用時，建議作調整電壓的分壓器使用，同時電位器的負載電阻 R_L 應不小于電位器公稱阻值 R_T 的 10 倍 (見圖 2)。電位器在直流電路中作為電流調節使用時，將有電流通過電位器的滑動臂，此時由于陽極氧化的原因會導致電阻值昇常增加。在這種情況下，建議將連接電阻體的端子接負極，滑動臂接正極 (見圖 3)。

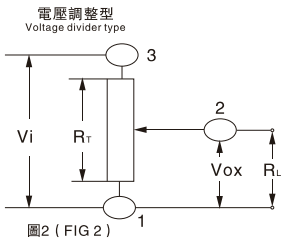


圖2 (FIG 2)

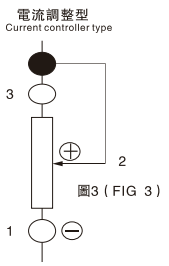


圖3 (FIG 3)

5. Residual Resistance 殘留電阻

Although electric poles of resistors are generally formed by silver printing, we provide carbon coating over the silver poles to enhance reliability against sulfurization. Contact us if you wish to use the part in a low residual resistance state.

盡管電位器電阻體是印刷銀層，但為了提高抗硫化的可靠性，通常在電阻體二極覆蓋一層面碳膜，如果希望低殘留電阻 . 請與本公司聯系。

6. Dew Condensation 凝露

Avoid using the potentiometer where dew or water drops might occur on the surface of the resistor, etc Deterioration of insulation or shorting occur .

電位器在使用過程中，電阻體表面應避免結露或水滴，否則，將導致絕緣電阻惡化或短路。

7. Stress Being Applied to The Terminals 施加于端于應力

Care must be taken not to apply excessive stress when handling the terminals. Also be sure to design appropriate soldering conditions.

手拿端子時應特別注意避免過分用力，同時應設計正確的焊錫條件。

8. Looseness of The Shaft 軸的徑向晃動

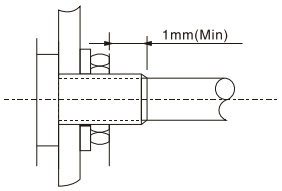
When long shaft are being employed, the looseness (deviation)tends to grow in proportion to the shaft length .Conducting a test under actual operating conditions is recommended.

當使用長度過分長的轉軸時，其徑向晃動量將與軸長成正比，應按實際需要選用軸長。

9. Chassis Mounting 面板安裝

When this part is fastened to the chassis using a nut, excessive tigh tening may deteriorate the rotary contact performance, or strip the threads. Exercise care when tightening the nut.

當電位器是用螺母安裝于面板時，過緊將使旋轉按觸功能失效或螺紋滑牙，鎖螺母時應非常小心。



10. Operation at Low Temperature 低溫工作

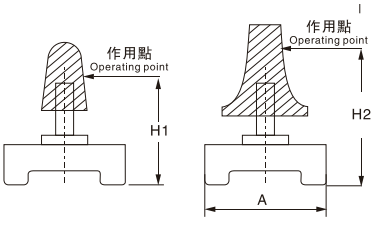
When these products are expected to be used under low temperature environments such as applications of car radios or car stereos, we can customize them for sassier and more smooth rotary movements. When placing orders, indicate whether the low temperature specification is necessary or not nut.

當產品是用于低溫環境時，如寒帶地區使用的汽車收音機或汽車音響等，本公司按客戶要求提供手感舒適產品，請定貨時加以說明。

11. Lever Length 滑柄長度

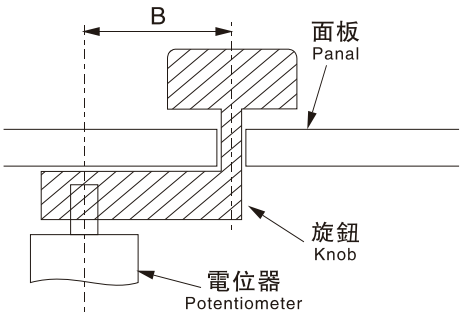
If conditions permit, it is recommended that using the shortest lever (over5mm) for the application. Since the length A of the slider is constant as shown, the shorter the length up to the operating point, the better slide feeling will be obtained. (the longer the length up to the operating point like H2 , the mkore unfavorable slide feeling will be given.)

長度越短越好 (至少 5mm) 在滑柄的寬度 A 不變情形下，滑柄長度越短，手感越好，另出力點越高，手感越差 (如圖) 。



12. Driving Lever 驅動臂

It is recommended that not to make the operating point away from the center line of the lever as shown. For the same reason as mentioned above, the shorter the length B the better slide feeling will be obtained.
切勿使操作點原理滑柄中心線，基於同樣理由，兩者距離 B 越短越好（如圖）。



■ Terms of Potentiometer 電位器術語解釋

1. Grouned Termina 接地端

This terminal is electrically connected to the shaft.
By connecting it to the set ground,ground noise (externally-induced noise) can be prevented.
在電器上與軸連接的端子起屏蔽外部噪聲作用。

2. Name of Terminal 端子的名稱

When describing the terminal numbers of a potentiometer, the terminals connected to both ends of a resistor element are called terminal 1 and terminal 3. The terminal connected to the sliding contact is called terminal 2.
面向電位器的驅動機構，將軸逆時針方向調節到盡頭時，在電氣上最靠近動觸點的終端引出端，稱為 1 段；另一端的終端引出端成為 3 端，觸動點的引出端稱為 2 端。

3. Temperature Characteristic 溫度特性

Resistance variation dependant upon temperature.
電阻值隨溫度變化的特性。

4. Rotational Torque 旋轉力矩（啟動力矩）

Torque to turn the operating shaft (operating knob).
使電位器轉軸 (或旋轉) 轉動所需的力矩。

5. Allowable Operating Torque 終端止檔力矩

Maximum operating torque that the operating shaft (operating knob) can endure in its full CW or CCW position.
當轉軸（或推鈕）轉到終端止檔位置而未引起檔點變形和其他可見損信時的最大力矩。

6. Detent 定位裝置

Mechanism that provides the click feel during operation.
電位器驅動機構造運動時，有手感定位大的機械裝置。

7. Derating Curve 降功耗曲錢

Curve that shows the relationship between the ambient temperature and maximum power. (Unit: percentage to rated power).
最大功功耗與環境溫度的關係曲線 (用額定功率的百分比表示)。

8. Nominal Total Resistance 標稱阻值

Resistance value that represents the specified values (reference resistance).
標志在電位器上的電阻值（標稱阻值）。

9. Cermet 金屬陶瓷

Resistor element with excellent environment endurance formed by high-temperature baking of oxidized metal on sudstrate.
其電阻體是由印製在陶瓷基板上的金屬氧化物經高溫烘烤所組成，具有良好的耐候性。

10. Maximum Allowable Operating Voltage 最高工作電壓

Maximum voltage applicable to the resistor specified for the potentiometer type.
Vmax= √ (P.R) Vmax---Maximum Voltage P---Rated powe R---Rated resistance, Vmax equal to the limiting element voltage,When R is more than the critical resistance
施加于電位器電阻體的最高電壓按下式計算 :
Vmax= √ (P.R) Vmax--- 最高工作壓力
P--- 額定功率 R-- 標稱阻值 . 如果 R 大于臨界電阻時 I Vmax 等于電阻體極限電壓。

11. Maximum Resolution 最大分解能

Number of bits in case of an absolute-type encoder or number of pluses per revolution in case of an incremental-type encoder.
絕對型編碼器的位元數或增量型編碼器旋轉一圈的脈衝數。

12. Residual Resistance 殘留電阻

Resistance (value) between the end terminal(terminal 1 or terminal 3) and the sliding terminal(ter-minal 2) when the control shaft(control part) is in its full CW or CCW position.
當驅動機構出於反時針或順時針極限位置時，終端 (端子 1 或端子 3) 與滑動段 (端子 2) 之間的電阻值。

13. Allowable Force in Push-pull Action for Lever 軸的推力和拉力

Maximum force at which the control part can endure without being broken when axial load is appliedto the shaft (lever).
電位器無可見損傷的情況下所能承受的軸向最大推力和拉力。

14. Shaft（Lever）Play 軸的徑向晃動（間隙）

Play(tilt)of the shaft(lever)when a specified force is applied perpendicular to the shaft(lever).
在垂直于軸心 (操縱桿) 方向事假一規定的力時軸 (操縱桿) 的傾斜。

15. Shaft Tilt 軸的傾斜

Parallel of perpendicular shift from the axial line or mounting surface with on load applied to the shaft,assuming the potentiometer mounting surface as reference.
以電位器安裝平面為基準，軸在無負荷狀態下，軸心線與安裝平面的平行度或垂直度的偏移。

16. Sliding Noise 滑動噪聲

Electrical noise that is generated when a potentiometer is operated, expressed as voltage or resistance ratio.
電位器操作時產生的電器噪聲，用電壓或電阻的比率表示。

17. Insulation Resistance 絕緣電阻

Insulation resistance between the conductive plate (terminal) of the prtentiometer, and the body or shaft (lever).The larger the value, the higher the insulation.
電位器所有引出端連接在一起與外部金屬件和轉軸 (操縱桿) 之間的電阻。

18. Total Rotational Angle 總旋轉角

Rotationla angle of the operating shaft between both ends.
操作軸在兩中點之間的旋轉角度。

19. Total Resistance and Tolerance 總阻值及允許偏差

A basic performance item of a potentiometer. Resistance

between terminal 1 and terminal 3 and its tolerance.
這是電位器的基本性能之一，紙在端子 1 與端子 3 之間的阻值及允許偏差。

20. Gang Error 相互偏差
Gap between respective resistance tapers of several potentiometers that make up a multi-ganged-type potentiometer. (Unit: decibel)
多聯電位器各聯之間電阻規律的偏差，用分貝表示。

21. Withstanding Voltage 耐電壓
Voltage at which the insulation between the conductive part of a potentiometer and the body or shaft (lever) is destroyed.
電位器活動部件與外部金屬件或轉軸（操縱桿）的絕緣未收破壞時所能承受的電壓。

22. Tap 抽頭
Terminal 4 is gengerally called the tap. It is installed in the middle of the resistor an is used in loudness circuits, balance adjusting circuits, etc.
端子 4 通常稱為抽頭，設置在電阻體中心位置，用於響度電路，平衡電路等。

23. Carbon Film(Resistor) 碳膜（電阻體）
Resistance element that is formed from a carbon-base film and used for general-purpose potentiometers.
一般用途電位器的電阻體，以碳素為基材形成的碳膜。

24. Mounting Dimensions 安裝尺寸
Dimensions for mounting a potentiometer on a PC board.
電位器用於 PC 板安裝時，PC 板安裝開孔尺寸。

25. Mounting Height 安裝高度
Height from the surface of the PC board to the top of the shaft when a rotary potentiometer is soldered on the board.
旋轉式電位器焊接于 PC 板時，從 PC 板安裝平面到軸心頂端的高度。

26. Solder Heat Resistance 耐焊錫熱
Variation of electrical characteristics by heat during soldering.
焊錫后電氣性能的變化。

27. Push-push 推 - 推 開關
A switch that toggles on and off by repetitive push operations.
指示一種推一下 ON，再推一下 OFF 的開關。

28. Friction 摩擦
In a dual-shaft,multi-unit product, the inner an outer shafts interlock by frictional force. Both the inner and outer shafts that normally interlock can be shifted mutually for volume control,level control and other purposes.
兩軸多聯電位器，內外軸利用摩擦力互鎖，通常內外軸能相互移位，器用途是作音量控制，電平控制等。

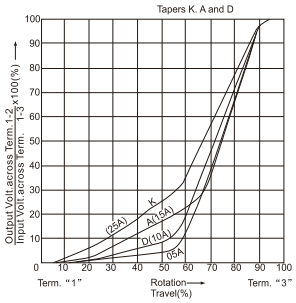
29. Printed Circuit Terminal 印刷電路端子
This is a terminal to be inserted in the mounting hole of a PCB and soldered.
這是一種插入印刷電路板焊接的端子。

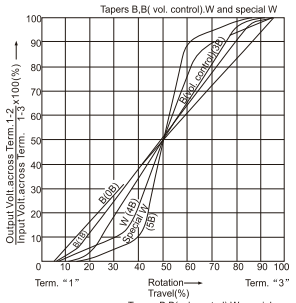
30. Resistance Taper 電阻規律
Characteristic that indicate the change in the resistance or output voltage of a potentiometer in reference with travel.
表示電位器的阻值或輸出電壓變化與行程的關係的特性。（見第三頁）

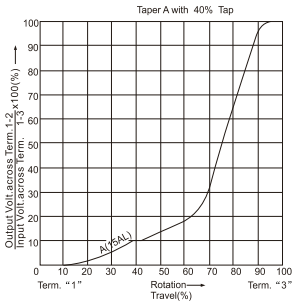
31. End Slip 終端無制動
This means free turning at the end of a potentiometer that has no stop mechanism (for end operation) in the control part.
無終端止檔機構電位器克 360°旋轉。

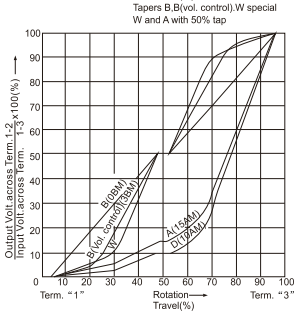
■ Resistance Taper Characteristics 電位器電阻線性特征

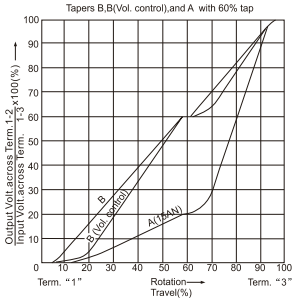
Resistance Taper	Test Position (%)	$\frac{V1\text{-}2}{V1\text{-}3}$ x 100% (%)	$\frac{V2\text{-}3}{V1\text{-}3}$ x 100% (%)
A	50	10-25	/
B	50	40-60	/
C	50(started from Term.3)	/	10-25
D	50	6-15	/
E	50	/	18-34
W	30 (±5degree)	5-15	/
W	50	40-60	/
W	70 (±5degree)	85-95	/

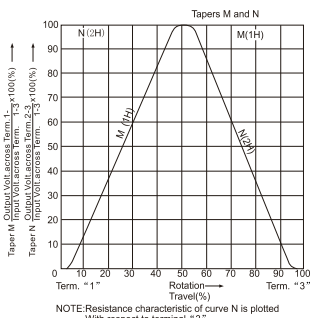




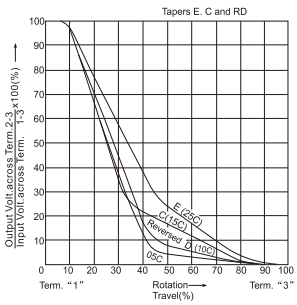




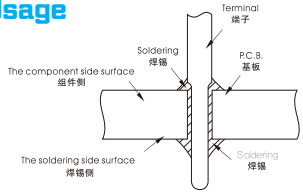




NOTE:Resistance characteristic of curve N is plotted With respect to terminal "3"



■ Caution of Encoder Usage 編碼器使用注意事項



1. Flux penetrating 焊劑滲入

Please avoid soldering on upper surface (componet sidesurface) of the P.C. Board as shown below.
請避免焊錫作業時將助焊劑滲入（組件側面）P.C.B 的表面。請參考附圖。

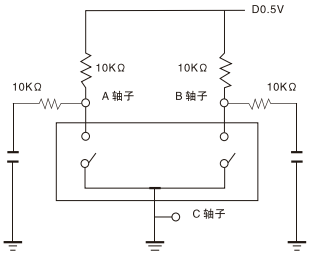
2. Clean 清洗

Please avoid cleaning of P.C. board because the flux used during the dip soldering process may enter the encoder and cause poor contact.
請避免清洗 PCB 板，由於浸入焊錫作業過程中，助焊劑有可能滲入編碼器內部，造成接觸不良。

3. Storage environment 存儲環境

Storage in high temperature, high humid and corrosive gas envirommment should be avoided.
請避免存放於高溫、潮濕及具腐蝕性的場所。

4. RC Filter circuit RC 濾波電路



For the implementation of the pulse count or menu control, always use the RC filter circuit shown as below.
在脈衝計算或選項控制的運用時，盡可能採用下圖所示的 RC 濾波電路過濾雜訊。

5. Pulse count operation 脈衝計數操作

For the pulse count operation, care should be taken with operational speed, sampling time and masking time etc.
必須注意時賣計算處理的動作方式。注意操作速度、取樣時間及遮罩時間等。

6. Application 應用設計

For product of with-detent type, detent position is always aligned with A-OFF phase; therefore, it is strongly recommended that use A output signal for the reference of the software design.
附定位點的產品，每個定位點停駐位置為 A 輸出訊號 OFF 狀態，因此在產品應用的軟體設計上，最好以 A 相位為參考基準。

7. Waterproofing 防水設計

Care must be taken not to expose this porduct to water or dew to prevent possible problem in pulse output waveforms.
本製品的本體必須避免直接接觸到水或露水，以免影響到輸出波形，造成輸出異常。

8. Radial Pressure 徑向壓力

To avoid excessive radial pressure to the shaft, for best performance consideration, care must be taken when choosing konb for the product.
本製品的主軸無法承受過度的徑向壓力，因此在選用旋鈕時，必須考慮軸套的側向壓力，以確保本製品的技能。

9. Impact 撞擊

Excessive impact force may decrease the performance or even cause damage of the product.For best performance consideration, care must be taken to avoid excess impact force.
本製品的主軸無法承受過度的撞擊力，為確保本製品的技能，請避免過度撞擊。

■ Terms of Encoder 編碼器術語解釋

1. Output Signal Format 輸出訊號

2Phase-different output signals (signal A and B). See the following <Fig. 1 >, (The broken line shows detent position of encoders with detent type).
兩相位差輸出訊號（A 及 B 訊號）詳細說明參見圖一，（虛線部分是帶卡點功能機型的卡點位置圖示）。

Shaft Rolational Direclion 回轉方向	Signal 信號	Output 輸出波形
C.W. 順時針方向 A	(Terminal A-C) A(A-C 端子間)	OFF ON OFF ON
C.C.W. 逆時針方向	B (Termlnal B-C) B(B-C 端子間)	OFF ON OFF ON

2. Resolution 分解能

Number of output pulses in 360° rotation.
旋轉 360°輸出脈波數目。

3. Switching Characteristics 電位轉換特性

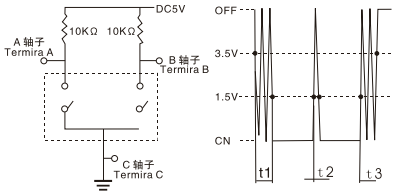
Measurement should be made under following conditions:
測量應按下列條件進行：

3.1 Shaft rotation speed 360° /sec 軸心旋轉速度 360° / 秒
3.2 Test Circuit: see <Fig.2> shows 測試電路見圖二示

Note: Code"OFF" area: The area where the voltage is 3.5V and more.
備註：OFF: 表示輸出電壓在 3.5V 以下區域。
Code"ON "area: The area where the voltage is 1.5V and less.
ON: 表示輸出電壓都 3.5V 以下區域。

3.3 Fluttering(Contact) 接觸彈跳雜訊
Specified by the signal's passage time from 3.5V to 1.5V or from 1.5V to 3.5V of each switching position (Code OFF-ON or ON → OFF).
表示訊號從 3.5V 切換到 1.5V(t1). 或從 1.5V 切換到 3.5V(t3) 時所通過的時間（編碼從 OFF → ON or ON → OFF）。

3.4 Sliding noise 滑動雜訊
Specified by the time of voltage level change drops to 1.5V and lower in code-ON area. When the sliding noise in code-ON area between t1 and t3 less than 2ms, they are regarded as one linked signal.
當電壓轉換到 1.5V 以下的 ON 區域時，在 t1 及 t2 區域之間所發生的小於 2ms 的雜訊（t2）視為連續的訊號。

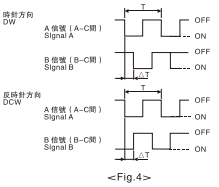


<Fig.2> <Fig.3>

4. Phase-difference 相位差

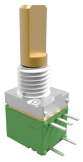
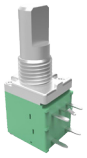
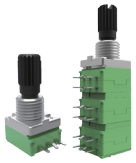
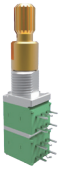
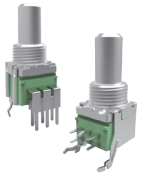
Measurement should be made with the specified shaft rotation speed with 360° /sec
相位差測試軸心旋轉速度為 360° / 秒。

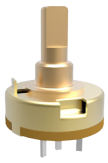
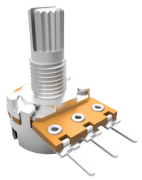
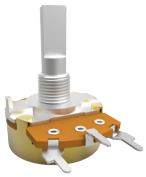
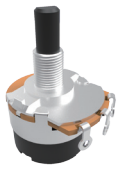
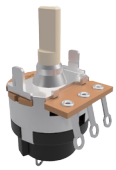
Note: This specification is changeable when shaft is operated by manual; please check the performance by using actual circuit and knob.
註：本規格當以手動檢查時因轉速不穩定會有所變動，請配合實際電路及旋轉來檢查其性能。



<Fig.4>

METAL SHAFT POTENTIOMETER

Product photo							
Series	F081	F082	F091	F092	F093	F094	F095
Operating Direction	Vertical	Vertical	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical
Package Diameter	8mm	8mm	9mm	9mm	9mm	9mm	9mm
Bushing Material	Metal	Metal	Metal	Metal	Metal	Metal	Metal
Power-linear	0.05W	0.05W	0.05W	0.05W	0.05W	0.05W	0.05W
Power-audio	0.025W	0.025W	0.025W	0.025W	0.025W	0.025W	0.025W
Life Cycle	30K	30K	15K	15K	15K	15K	15K
Swith Option	Y	Y	Y	Y	Y	N/A	N/A
Detnet Option	Y	Y	Y	Y	Y	Y	N/A
Number of Gangs	1-6	2-6	1-6	2-6	1-6	1-6	1-6
Page							

Product Photo						
Series	F131K	F16K	F24KM	F24KP	F24KSPP	F24K5
Operating Direction	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical	Vertical
Package Diameter	13mm	16mm	24mm	24mm	24mm	24mm
Bushing Material	Metal	Metal Plastic	Metal	Plastic	Plastic	Metal
Power-linear	0.1W	0.2W	0.5W	0.5W	0.5W	0.5W
Power-audio	0.04W	0.1W	0.25W	0.25W	0.25W	0.25W
Life Cycle	1Million	15K	15K	15K	15K	1Million
Swith Option	N/A	Y	Y	Y	Y	N/A
Detnet Option	N/A	Y	N/A	N/A	N/A	N/A
Number of Gangs	1-6	1	1	1	1	1
Page						

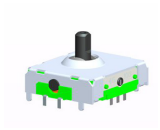
INSULATED SHAFT POTENTIOMETER

Product Photo						
Series	F09K	F11K	F14K	F09R	F11R	F1001
Operating Direction	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical
Package Diameter	9mm	11mm	14mm	11mm	11mm	10mm
Bushing Material	Metal	Plastic	Metal Plastic	Metal	Plastic	N/A
Power-linear	0.05W	0.05W	0.05W	0.05W	0.05W	0.05W
Power-audio	0.025W	0.025W	0.05W	0.025W	0.025W	0.025W
Life Cycle	15K	15K	15K	15K	15K	10K
Swith Option	N/A	N/A	N/A	N/A	N/A	Y
Detnet Option	Y	Y	Y	Y	Y	N/A
Number of Gangs	1-2	1-2	1-2	1-2	1-2	1-2
Page						

JOYSTICK POTENTIOMETER

Product photo							
Series	FJ08K	F10K	F10KV	FM10K	FJM10K	FJN08K	FJN10K
Operating Direction	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical
Package diameter	17.5mm	10.5mm	10.0mm	10.5mm	16.7mm	20mm	20.3mm
Life cycle	1Million	1Million	1Million	1Million	1Million	2Million	1Million
Swith Option	Y	N/A	N/A	N/A	Y	N/A	Y
Shaft Material	Plastic	Plastic	Plastic	Plastic	Plastic	Plastic	Plastic
Page							

JOYSTICK POTENTIOMETER

Product Photo			
Series	FJP06K	FJP10K	FJH06K
Operating Direction	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical
Package Diameter	21.1mm	20.3mm	11.2mm
Life Cycle	2Million	1Million	2Million
Swith Option	Y	Y	Y
Shaft Material	Plastic	Plastic	Metal
Page			

SLIDE POTENTIOMETER

Product Photo					
Series	Fxx91	Fxx92	Fxx31	Fxx3	Fxx05
Operating Direction	Vertical	Vertical	Horizontal	Horizontal	Horizontal
Life Cycle	15K	15K	15K	15K	15K
Element	1-2	1-2	1-2	2	1-2
Travel（mm）	20/30	20/30	15/20/30/45	30/45/60	15/20/30/45/60
Lever Length	9.5	9.5	5/10/15/20	10/15/16/20/25	110
Page					

Product Photo					
Series	Fxx06	Fxx43	Fxx45	Fxx46	F10008
Operating Direction	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Life Cycle	15K	15K	15K	200K	50K
Element	1-2	1	1-2	2	1-2
Travel（mm）	15/20/30/45/60	20/30/45/60	20/30/45/60	45/60	100
Lever Length	10/15/20/25	10/15/20/25	5/10/15/20/25	8/15/16/20/25	13.5/14.5
Page					

TRIMMER POTENTIOMETER

Product Photo						
Series	GC03	GTM06	FTB06	GTM08	FTB10	FTB15
Operating Direction	Horizontal	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical
Package Diameter	3mm	6mm	6mm	8mm	10mm	15mm
Life Cycle	20K	50K	10K	50K	10K	10K
Mounting	Surface mounting	Through hole	Through hole	Through hole	Through hole	Through hole &SMD
Element	Cermet	Cermet	Cermet	Cermet	Cermet	Cermet
Temperature ppm/° C	±250	±250	±500	±250	±500	±500
Tolerance	±25%	±20%	±20%	±20%	±20%	±20%
Power Rating	0.1W	0.3W	0.1W	0.5W	0.15W	0.25W
Page						

ROTARY ENCODER

Product Photo						
Series	F08xE	F11E	F11ET	F11ER	F11E	F16E
Operating Direction	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical	Horizontal Vertical
Package Diameter	11mm	11mm	11mm	11mm	12mm	16mm
Bushing Material	Metal	Metal	Metal	Metal	Metal,Plastic	Metal
Life Cycle	50K	30K	30K	30K	30K	30K
Swith Option	Y	Y	Y	Y	Y	N/A
Detent Option	15, 20	15, 20	15, 20	N/A	12, 24	12, 24
Pulse	15, 20	15, 20	15, 20	N/A	12, 24	12, 24
Shaft Material	Metal	Metal	Metal	Metal	Plastic	Plastic
Page						

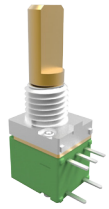
ROTARY SWITCH

Product Photo			
Series	FSR08	FSR1001	FSR1002
Life Cycle	50K	10K	30K
Swith Option	Y	Y	Y
Detnet Option	16	2-6	20
Operating Type	Rotary	Rotary	Rotary
Power Rating	AC 50V, DC 10V (1mA)	0.1A, DC16V	0.1A, DC 16V
Page			

SENSOR

Product Photo							
Series	FSE04	FSE07	FSE10	FSE11	FSE28	FHS22	FHS50
Package Diameter		7mm	10mm	12mm	17mm	22mm	17mm
Life Cycle	300K	1Million	20K	1Million	200K	10Million	10Million
Swith Option	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Detent Option	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tolerance	±20%	±20%	±20%	±30%	±20%	±3%	±3%
Operating Type	Rotary	Rotary	Slide	Rotary	Rotary	Multiway	Multiway
Power Rating	0.01W	0.1W	0.1W	0.1W	0.1W	0.01W	0.1W
Page							

F081 Series Metal Shaft Potentiometer



Feature

1. Flux builded-up preverntion is taken through inserting molding around the resistor with resin.
2. A large variety of products lined up to support various applications.
3. Miniature design for audio applications.
4. Long life type available.

8mm Rotary Potentiometer.

Application:

- Wireless Intercom
- Car Stereo
- Wireless Equipment
- Small Machines

Electrical Characteristics

Total Resistance	1kΩ~1MΩ
Resistance Tolerance	500Ω<R<1MΩ: ±20%; R≤500Ω or R≥1MΩ: ±30%
Resistance Taper	A, B, C
Max. Operating Voltage	AC 50V, DC 10V
Rated Power	0.05W
Rotational Noise	100mv Max.
Insulation Resistance	More than 100MΩ at DC250V
Withstand Voltage	1 minute at AC 300V
Residual Resistance	50Ω Max.
Gang Error (Dual Unit or Multiunit)	-40dB~0dB±3dB

Switch Characteristics

Rated Power	3.0A at DC 16V
Contact Resistance	Less than 50 mΩ
Switch Angle	30° ±10°
Switch Torque	5-25mN·m
Switch Life	25,000 cycles at without Load

Mechanical Characteristics

Detent	1(Center)detent, 11detents
Total Rotational Angle	300° ±10°
Push-pull Strength	Pull: 100N Min. ; Push: 100N Min. at 10sec
Rotational Torgue	2~10mN·m
Stopper Strength	300mN·m Min.
Shaft Woble	0.5mm Max.
Detent Torque	3~18mN·m
Bushing Nut Tighten Strength	1N·m Min.

Durability

Rotational Life	Standard Life: 30,000 cycles Min. Long Life: 100,000 cycles Min.
Operating Temperature Range	-20° C~+70° C
Cold Test	-20±2° C for 96 hr, △ TR≤±15%
Dry Heat	70±2° C for 96 hr, △ TR≤±15%
Temperature Cycle	-20~+70° C, 5cycles, △ TR≤±15%
Soldering Condition	Wave Soldering: 260±5° C 5sec Max; Manual Soldering: 350±10° C 3sec Max.

HOW TO ORDERD

F081-	1	6	5	S	1	F	1	C	B	100K	1

Model Series

Gang Number
1: 1 Gang
2: 2 Gangs
3: 3 Gangs
4: 4 Gangs

Bushing Thread

6: M6
7: M7

Length of Type

5: 5.0mm

SwithType

N: No Switch
S: With Rotary Switch

DetentOption

0: No Shaft Detent
1: With Center Detent
2: With 11 Shaft Detents

Shaft Type & Length

See Note 1

Full CCW Position

See Note 2

ResistanceTaper

A: Audio (15A)
B: Linear, (Single Unit:1B; Dual & Mulitgangs: 3B)
C: Reverse Audio(15C)
D: Audio(10A)

Total Resistance

1K	2K
5K	10K
20K	50K
100K	200K
500K	1MEG

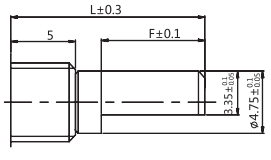
OperationLife

(Blank): Std Life w/o Anti-sulfur
1: Std Life w/Anti-sulfur
2: Long Life w/ Anti-sulfur
3: Long Life w/o Anti-sulfur

Note 1: Shaft Type and Lengths

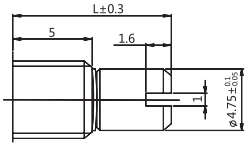
F-Type

Code	1	2	3	4
L	10	12	15	17
F	4	7	10	12

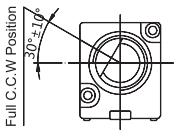
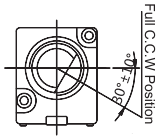
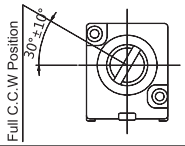
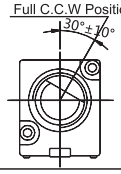
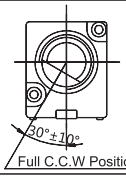
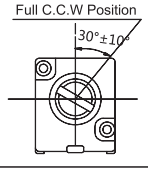


S-Type

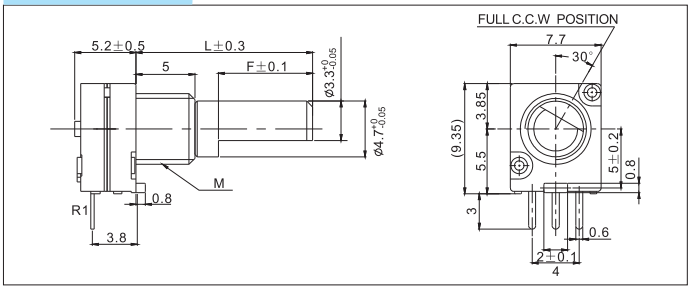
Code	1	2	3	4
L	10	15	20	25

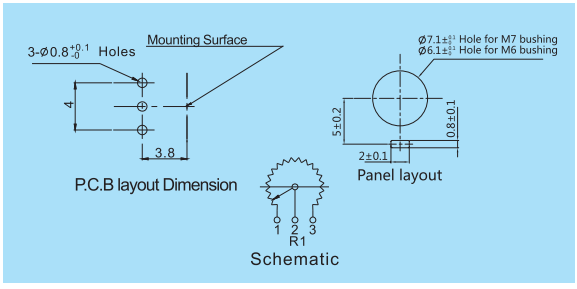


Note 2: Full C.CW Shaft Position

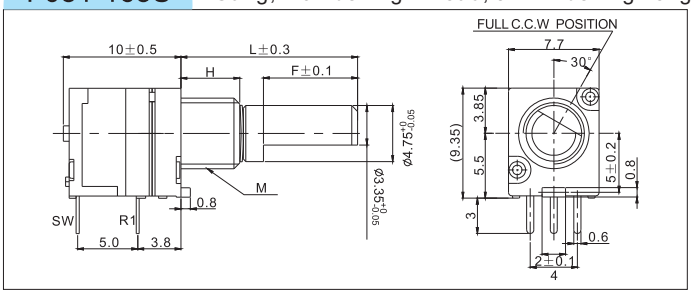
F-Type Shaft		S-Type Shaft
A. 	B. 	A. 
C. 	D. 	C. 

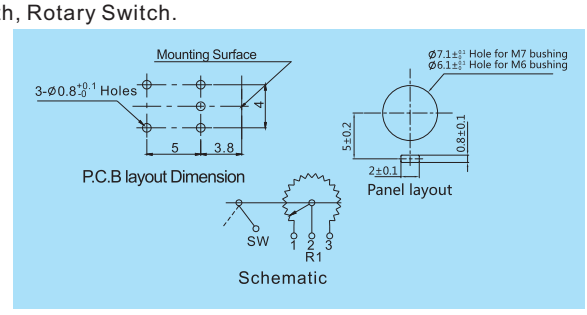
F081-165N 1Gang, M6 Bushing Thread, 5mm Bushing Length, No Switch.



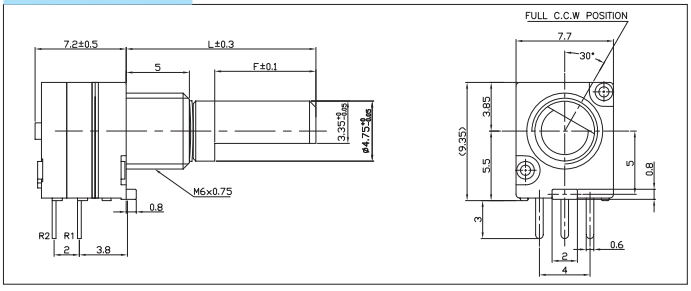


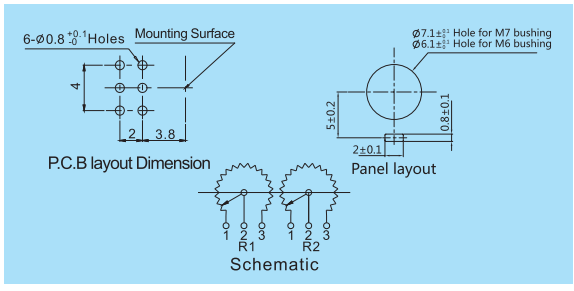
F081-165S 1Gang, M6 Bushing Thread, 5mm Bushing Length, Rotary Switch.



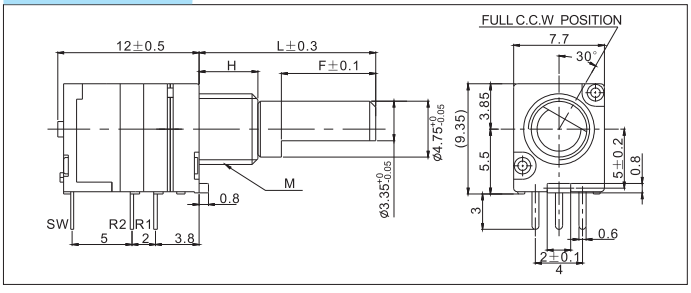


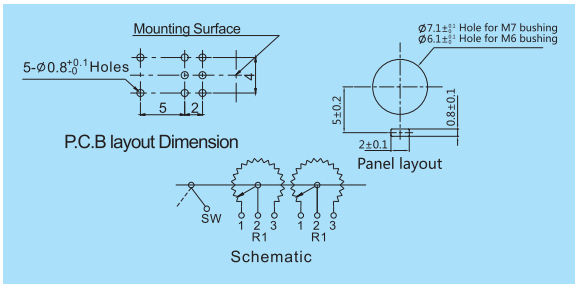
F081-265N 2 Gangs, M6 Bushing Thread, 5mm Bushing Length, No Switch.



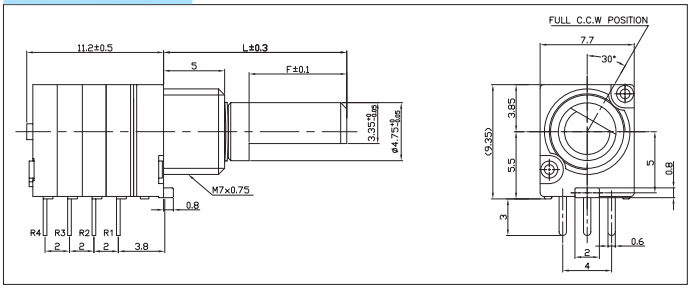


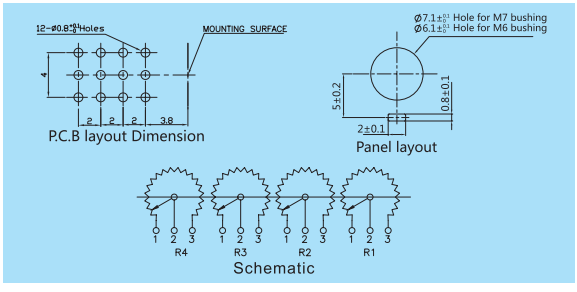
F081-265S 2 Gangs, M6 Bushing Thread, 5mm Bushing Length, Rotary Switch.





F081-475N 4 Gangs, M7Bushing Thread, 5mm Bushing Length, No Switch.





F082 Series Metal Shaft Potentiometer

Feature

1. Flux builded-up preverntion is taken through inserting molding around the resistor with resin.
2. A large variety of products lined up to support various applications.
3. Dual shaft and miniature design for audio applications.
4. Long life type available.

8mm Rotary Potentiometer.

Application:

- Wireless Intercom
- Car Stereo
- Wireless Equipment
- Small Machines

Electrical Characteristics

Total Resistance	1kΩ~1MΩ
Resistance Tolerance	500Ω<R<1MΩ: ±20%; R≤500Ω or R≥1MΩ: ±30%
Resistance Taper	A, B, C
Max. Operating Voltage	AC 50V, DC 10V
Rated Power	0.05W
Rotational Noise	100mv Max.
Insulation Resistance	More than 100MΩ at DC250V
Withstand Voltage	1 minute at AC 300V
Residual Resistance	50Ω Max.
Gang Error (Dual Unit or Multiunit)	-40dB~0dB±3dB

Switch Characteristics

Rated Power	3.0A at DC 16V
Contact Resistance	Less than 50 MΩ
Switch Angle	30° ±10°
Switch Torque	5-25mN·m
Switch Life	25,000 cycles at without Load

Mechanical Characteristics

Detent	1(Center)detent, 11detents
Total Rotational Angle	300° ±10°
Push-pull Strength	Pull: 100N Min. ; Push: 100N Min. at 10sec
Rotational Torgue	2~10mN·m
Stopper Strength	300mN·m Min.
Shaft Woble	0.5mm Max.
Detent Torque	2~25mN·m
Bushing Nut Tighten Strength	1N·m Min.

Durability

Rotational Life	Standard Life: 30,000 cycles Min. Long Life: 100,000 cycles Min.
Operating Temperature Range	-20° C~+70° C
Cold Test	-20±2° C for 96 hr, △ TR≤±15%
Dry Heat	70±2° C for 96 hr, △ TR≤±15%
Temperature Cycle	-20~+70° C, 5 cycles, △ TR≤±15%
Soldering Condition	Solder Dip: 260±5° C 5sec Max; Manual Soldering: 350±10° C 5sec Max.

HOW TO ORDERD

F082-	2	6	5	S	2	F	1	C	B	100K	

Model Series

Gang Number
- 2: 2 Gangs
- 4: 4 Gangs

Bushing Thread
- 6: M6
- 7: M7

Length of Type
- 5: 5.0mm

Swith Type
- N: No Switch
- S: With Rotary Switch

Shaft Type & Length
- See Note 1

Full CCW Position
- See Note 2

Detent Option (Both Inner&Outer Shaft)
- 0: No Shaft Detent
- 1: With Center Detent
- 2: With 11 Shaft Detents

Resistance Taper
- A: Audio (15A)
- B: Linear,(Single unit:1B; Dual &Mulitgangs: 3B)
- C: Reverse Audio(15C)
- D: Audio(10A)

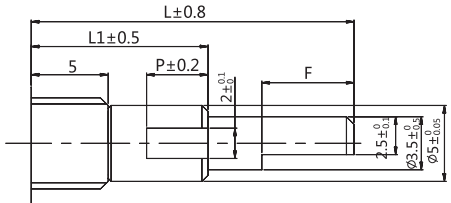
Total Resistance

1K	2K	5K	10K	20K
50K	100K	200K	500K	1MEG

Operation Life
- (Blank): Std Life w/o Anti-sulfur
- 1: Std Life w/Anti-sulfur
- 2: Long Life w/ Anti-sulfur
- 3: Long Life w/o Anti-sulfur

Note 1: Shaft Type and Lengths

F-Type

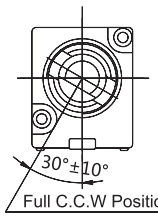


Code	1
L	21
L1	11.5
P	4
F	6

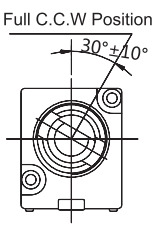
Note 2: Full C.CW Shaft Position

F-Type Shaft

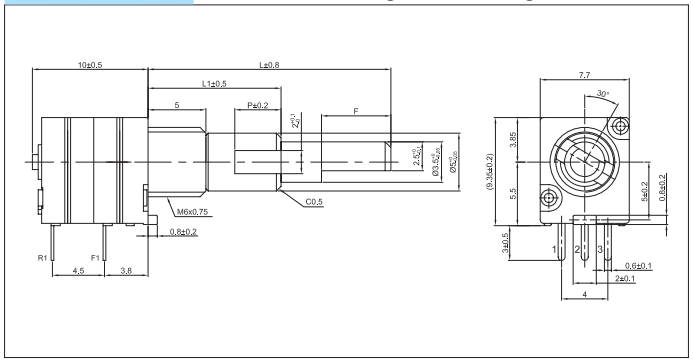
D

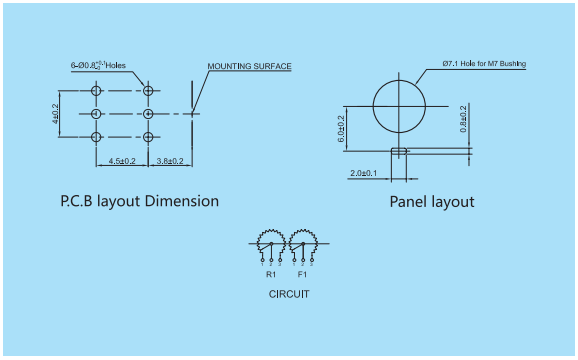


C

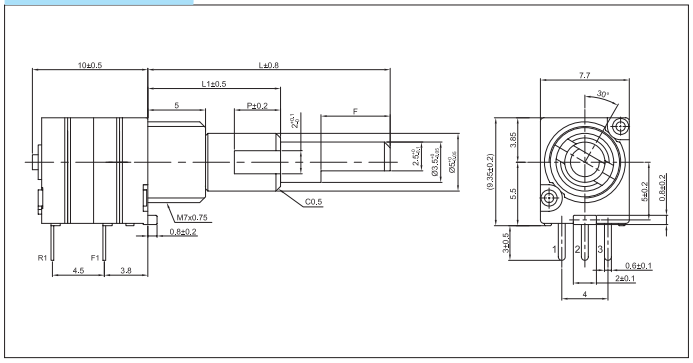


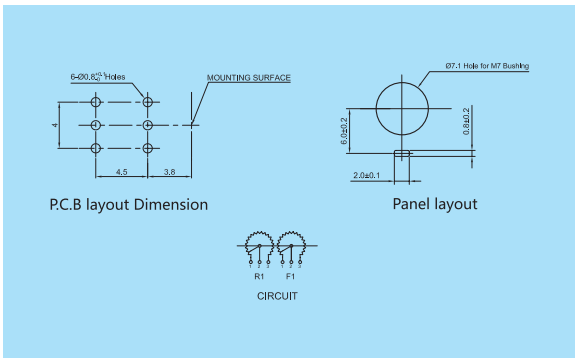
F082-265N Dual Shaft, 2 Gangs, M6 Bushing Thread, 5mm Bushing Length, No Switch



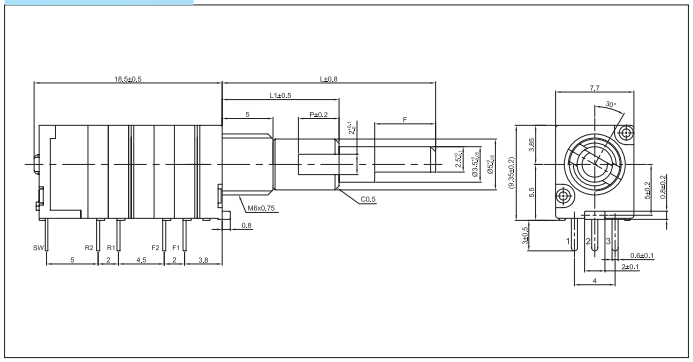


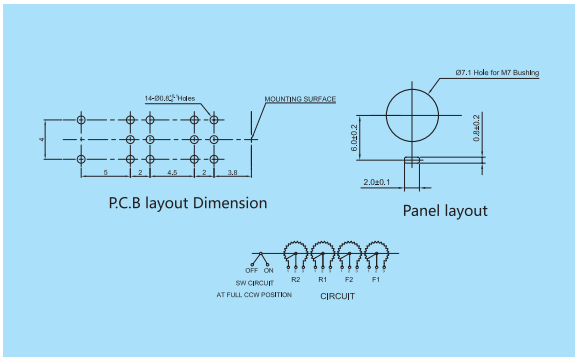
F082-275N Dual Shaft, 2 Gangs, M7 Bushing Thread, 5mm Bushing Length, No Switch



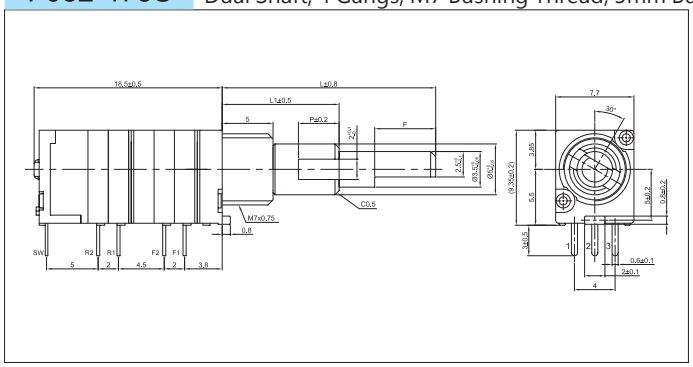


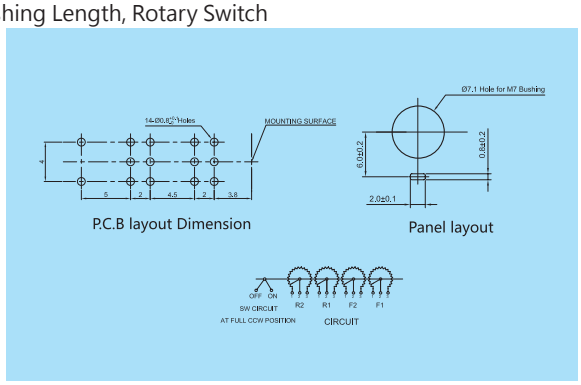
F082-465S Dual Shaft, 4 Gangs, M6 Bushing Thread, 5mm Bushing Length, Rotary Switch



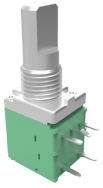


F082-475S Dual Shaft, 4 Gangs, M7 Bushing Thread, 5mm Bushing Length, Rotary Switch





F091 Series Metal Shaft Potentiometer



Feature

1. Flux builded-up preverntion is taken through inserting molding around the resistor with resin.
2. A large variety of products lined up to support various applications.
3. Long life type available.

F091 Series Rotary Potentiometer.

Application:

- Wireless Intercom
- Car Stereo
- Wireless Equipment
- Video Machine

Electrical Characteristics

Total Resistance	1KΩ~1MΩ
Total Resistance Tolerance	500Ω<R<1MΩ: ±20%; R≤500Ω or R≥1MΩ: ±30%
Resistance Taper	A, B, C
Max. Operating Voltage	AC 50V, DC 10V
Rated Power	Linear Taper B: 0.05W Other Tapers B: 0.025W
Rotational Noise	100mv Max.
Insulation Resistance	More than 100MΩ at DC250V
Withstand Voltage	1 minute at AC 300V
Residual Resistance	Term.1~2: Less than 20Ω Term.2~3: Less than 20Ω
Gang Error (Dual Unit or Multiunit)	-40dB~0dB±3dB

Durability

Rotational Life	15,000 cycles
Operating Temperature Range	-10° C~+70° C
Storage Temperature Range	-30° C~+80° C

Mechanical Characteristics

Total Rotational Angle	300° ±10°
Rotational Torgue	0.5~9mN·m
Click Torque	5~20mN·m
Stopper Strength	400mN·m Min.
Push-pull Strength	60N Min.
Bushing Nut Tighten Strength	0.8N·m Min.
Number of Detents (click)	1C(Center Detent), 11C, 21C, 41C
Lock Action Push (Pull)	20~45mN·m

Switch Characteristics

Contact Resistance	Less than 100 MΩ
Rated Power	Push: 0.5A at DC 12V Rotational: 3.0A at DC 16V
Push Stroke Length	0.5+0.5/-0.3 mm
Switch Angle	50° Max.
Switch Torque	Push: 2.5~5.5N ; Rotational: 1~3.5N
Switch Circuit	S. P. S. T & D. P. S. T
Switch Life	15,000 cycles

HOW TO ORDERD

F091-	H	2	5	S	1	F	1	C	B	100K	1

Model Series

Terminal Configuration

V: Side Adjust, PC Pins
H: Top Adjust, PC Pins

Gang Number

1: 1 Gang
2: 2 Gangs
3: 3 Gangs
4: 4 Gangs
6: 6 Gangs

Length of Bushing

5: 5.0mm
7: 7.0mm
0: 10mm

Swith Type

N: No Switch
S: With Rotary Switch
M: With Momentary Switch
P: With Push Lock
B: With both Momentary and Rotary Switch

Detent Option

0: No Shaft Detent
1: With Center Detent
2: With 11 Shaft Detents
3: With 21 Shaft Detents
4: With 41 Shaft Detents

Shaft Type & Length

See Note 1

Full CCW Position

See Note 2

Resistance Taper

A: Audio (15A)
B: Linear, (Single Unit: 1B; Dual & Mulit-gangs: 3B)
C: Reverse Audio(15C)
D: Audio(10A)

Total Resistance

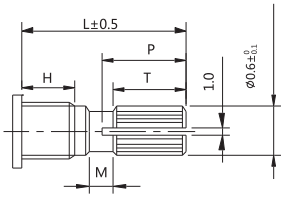
1K	2K	5K
10K	20K	50K
100K	200K	
500K	1MEG	

Operation Life

(Blank): Std Life w/o Anti-sulfur
1: Std Life w/Anti-sulfur
2: Long Life w/Anti-sulfur
3: Long Life w/o Anti-sulfur

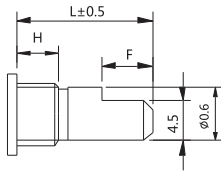
Note 1: Shaft Type and Lengths (1) No Push Lock

Q-Type



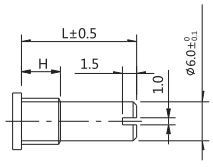
H	Bushing Length H=5							Bushing Length H=7						Bushing Length H=10					
Code	1	2	3	4	5	6	7	1	2	3	4	5	6	1	2	3	4	5	6
L	10	12	15	17	20	25	30	15	17	18	20	25	30	18	19	20	22	25	30
P	4	5	7	10	13	14	14	6.5	8	9	11	12	14	6	7	6.5	8	11	14
T	4	4	6	9	12	12	12	5.5	7	8	10	10	12	5	6	6	7	10	12
M	1	1	1	2	2	2	4	1	1	1	1	2	4	1	1	1	2	2	4

A-Type



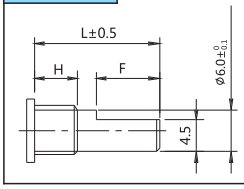
Bushing Length H=5				
Code	1	2	3	4
L	12.5	14.6	15	20
F	6	7	7	12

S-Type



H	Bushing Length H=5							
Code	1	2	3	4	5	6	7	8
L	7	8	10	15	17	20	25	30
H	H=7				H=10			
Code	1	2	3	4	1	2	3	4
L	15	20	25	30	15	20	25	30

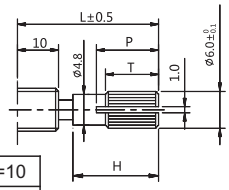
F-Type



H	Bushing Length H=5										Bushing Length H=7								Bushing Length H=10				
Code	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	1	2	3	4	5
L	10	12.5	15	17	17	20	20	25	25	30	13	15	17	20	21.8	25	25	30	15	17	20	25	30
F	4	6	7	5	9	7	12	12	15	12	5	7	7	12	12	12	15	12	4	5.5	7	12	12

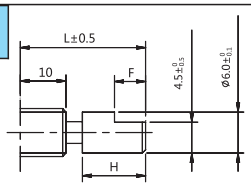
(2) With Push Lock

Q-Type



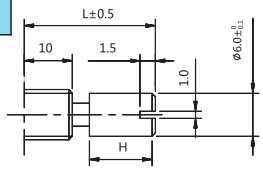
Bushing Length H=10			
Code	1	2	3
L	25	30	35
H	5.7	10.7	15.7
P	4	7	13
T	3	6	12

F-Type



Bushing Length H=10			
Code	1	2	3
L	25	30	35
F	4.5	7	12
H	5.7	10.7	15.7

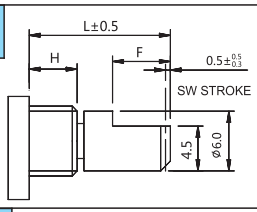
S-Type



Bushing Length H=10			
Code	1	2	3
L	25	30	35
H	5.7	10.7	15.7

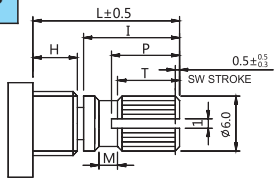
(3) With Momentary Switch

F-Type



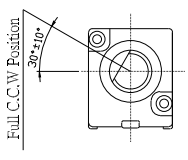
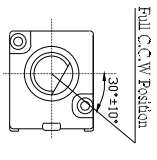
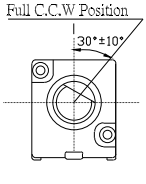
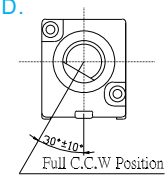
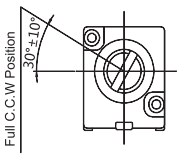
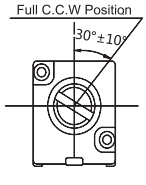
H	Bushing Length H=5					H=7				H=10		
Code	1	2	3	4	5	1	2	3	4	1	2	3
L	10	15	20	25	30	15	20	25	30	20	25	30
F	3	7	12	12	12	6	10	12	12	7	12	12

Q-Type



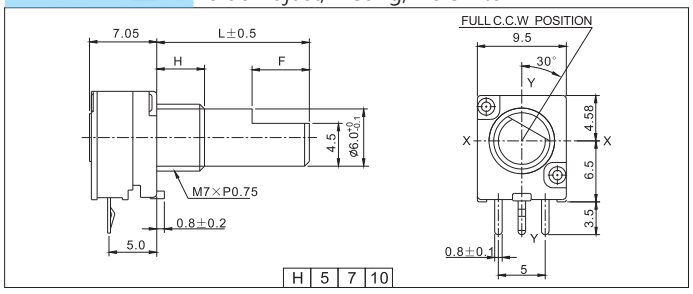
H	Bushing Length H=5								H=10			Bushing Length H=7						
Code	1	2	3	4	5	6	7	8	1	2	3	1	2	3	4	5	6	7
L	10	15	15	20	20	25	25	30	20	25	30	15	15	20	20	25	25	30
P	3.2	6.5	7	11	13	12	14	14	6.5	11	14	6	6.5	11	12	12	14	14
T	3.2	5.5	6	10	12	10	12	12	6	10	12	6	6.5	10	11	10	12	12
M	1	1	1	1	1	2	2	4	1	2	4	1.2	1	1	1.2	2	2	4

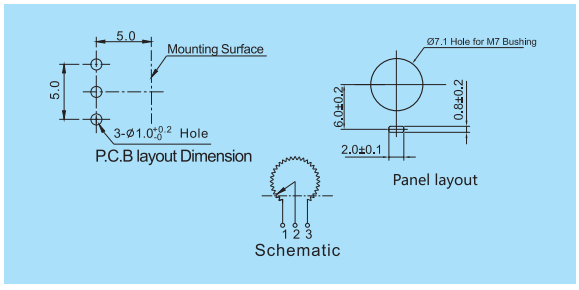
Note 2: Full C.CW Shaft Position:

F/A-Type Shaft				Q/S-Type Shaft	
A.	B.	C.	D.	A.	C.
					

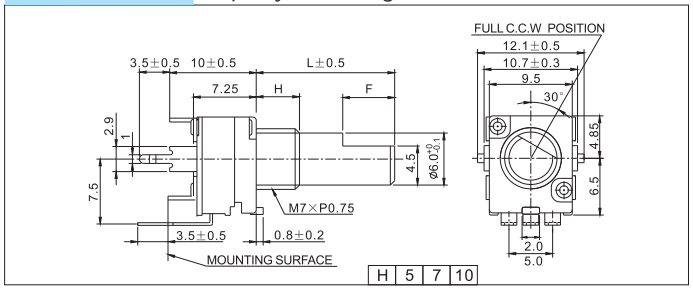
F091 Series Metal Shaft Potentiometer

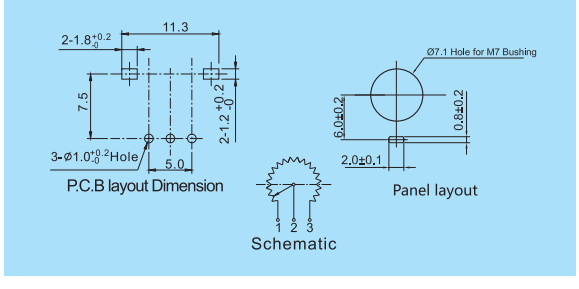
F091-V1□N Side Adjust, 1 Gang, No Switch



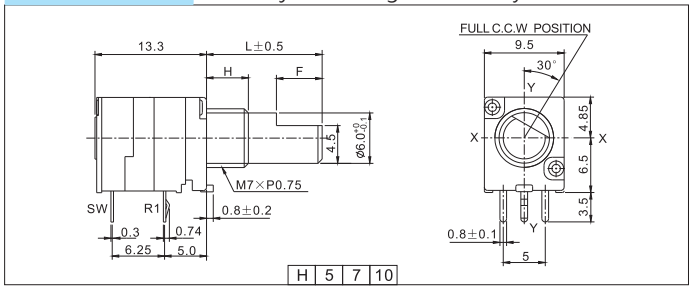


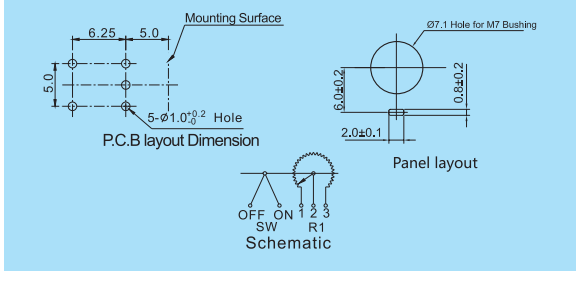
F091-H1□N Top Adjust, 1 Gang, No Switch



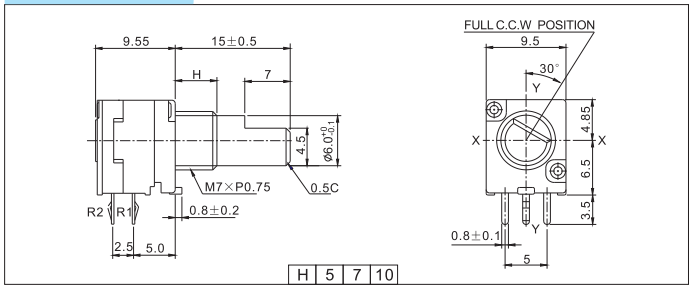


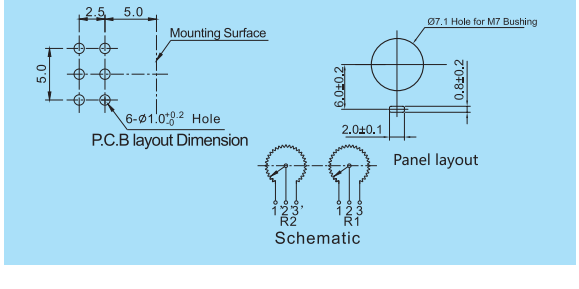
F091-V1□S Side Adjust, 1 Gang, with Rotary Switch



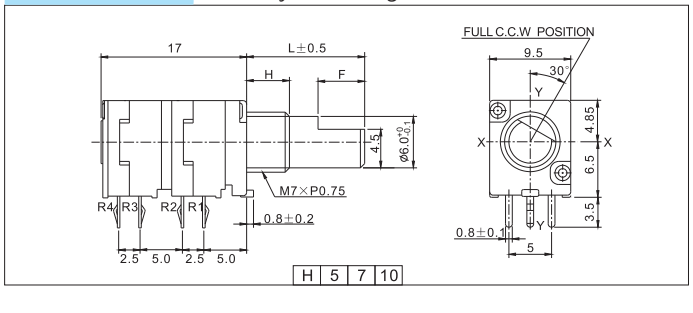


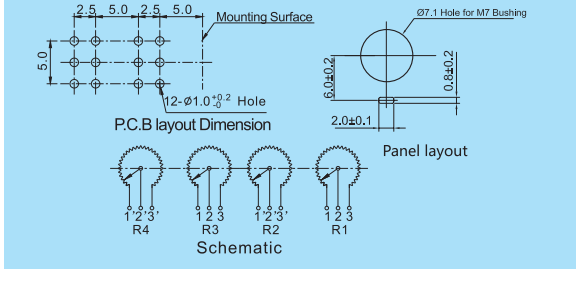
F091-V2□N Side Adjust, 2 Gangs, No Switch



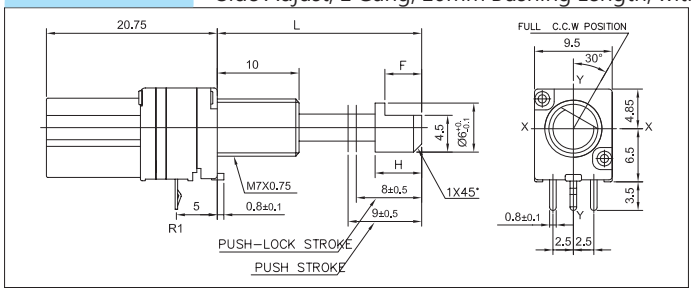


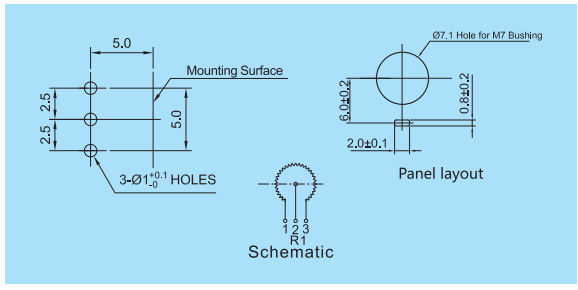
F091-V4□N Side Adjust, 4 Gangs, No Switch



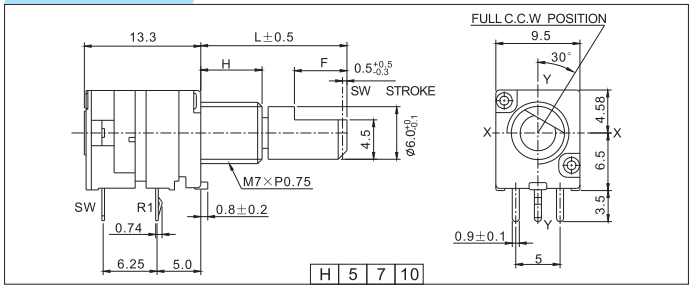


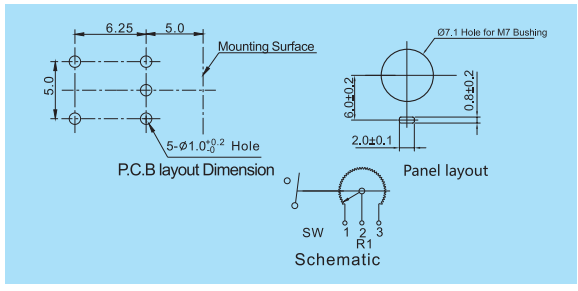
F091-V10P
Side Adjust, 1 Gang, 10mm Bushing Length, with Push-Lock Switch



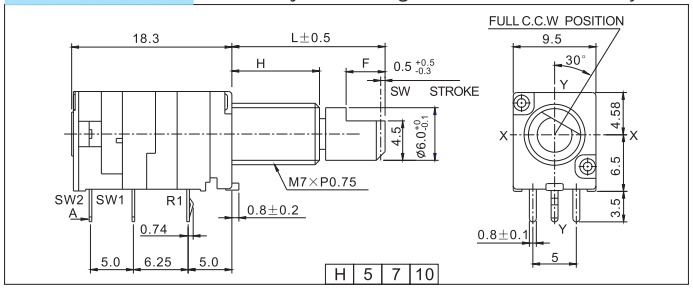


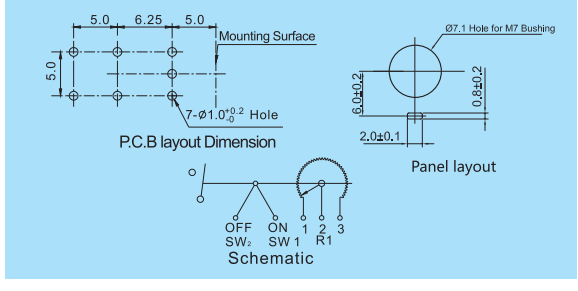
F091-V1□M
Side Adjust, 1 Gang, with Momentary Switch



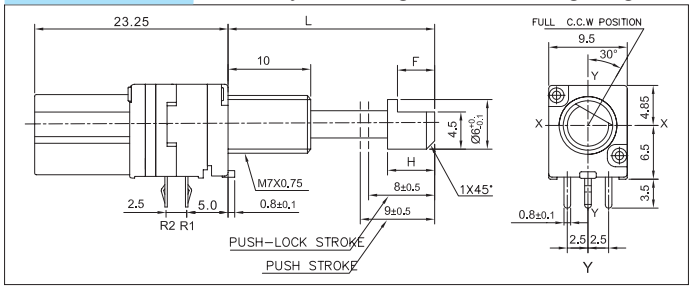


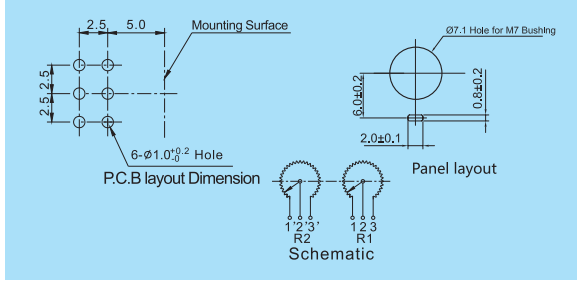
F091-V1□B
Side Adjust, 1 Gang, with both Momentary and Rotary Switch



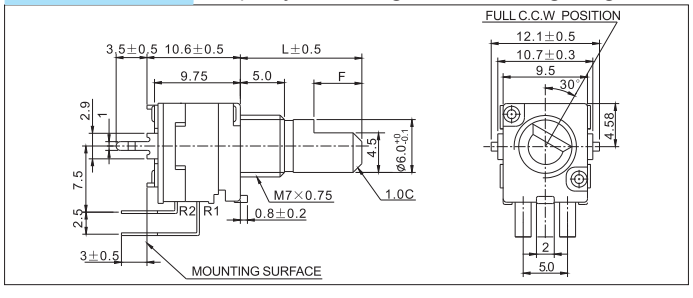


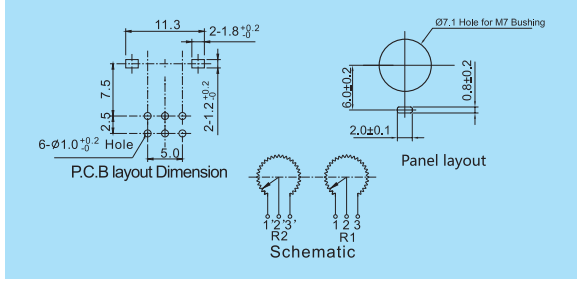
F091-V20P
Side Adjust, 2 Gangs, 10mm Bushing Length, with Push-Lock Switch





F091-H25N
Top Adjust, 2 Gangs, 5mm Bushing Length





F092 Series Metal Shaft Potentiometer

Feature

1. Flux builded-up preverntion is taken through inserting molding around the resistor with resin.
2. A large variety of products lined up to support various applications.
3. With dual shaft adjustment.
4. Long life type available.

F092 Series Rotary Potentiometer.

Application:

- Wireless Intercom
- Car Stereo
- Wireless Equipment
- Video Machine

Electrical Characteristics

Total Resistance	1KΩ~1MΩ
Total Resistance Tolerance	500Ω<R<1MΩ: ±20%; R≤500Ω or R≥1MΩ: ±30%
Resistance Taper	A, B, C
Max. Operating Voltage	AC 50V, DC 10V
Rated Power	Linear Taper B: 0.05W Other Tapers B: 0.025W
Rotational Noise	100mv Max.
Insulation Resistance	More than 100MΩ at DC250V
Withstand Voltage	1 minute at AC 300V
Residual Resistance	Term.1~2: Less than 20Ω Term.2~3: Less than 20Ω

Mechanical Characteristics

Total Rotational Angle	300° ±10°
Click Torgue	5~20mN·m
Stopper Strength	400mN·m Min.
Push-pull Strength	60N Min.
Rotational Torgue (Outer Shaft)	0.5~9mN·m
Rotational Torgue (Inner Shaft)	0.3~6mN·m

Switch Characteristics

Rated Power	3.0A at DC 16V
Contact Resistance	Less than 100 mΩ
Switch Angle	50° Max.
Switch Torque	10~35mN·m

Durability

Rotational Life	Standard Life: 15,000 cycles ; Long Life: 100,000 cycles
Operating Temperature Range	-10° C~+70° C

HOW TO ORDERD

F092-	2	5	S	1	1	F	1	C	B	100K	

Model Series

Gang Number
2: 2 Gangs
3: 3 Gangs
4: 4 Gangs
6: 6 Gangs

Length of Bushing

5: 5.0mm
7: 7.0mm
0: 10mm

Swith Type

N: No Switch
S: Rotary Switch

Inner Sharft / Outer Sharft

Detent Option
0: No Shaft Detent
1: With Shaft Center Detent
2: With 11 Inner Shaft Detents
3: With 21 Inner Shaft Detents
4: With 41 Inner Shaft Detents

Shaft Type & Length

See Note 1

Full CCW Position

See Note 2

Resistance Taper

A: Audio (15A)
B: Linear, (3B)
C: Reverse Audio(15C)
D: Audio(10A)

Total Resistance

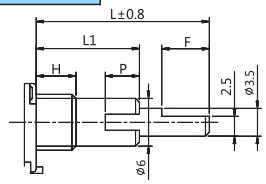
1K	10K
2K	20K
5K	50K
100K	
200K	
500K	
1MEG	

Operation Life

(Blank): Std Life w/o Anti-sulfur
1: Std Life w/Anti-sulfur
2: Long Life w/ Anti-sulfur
3: Long Life w/o Anti-sulfur

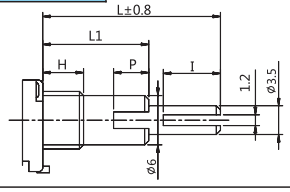
Note 1: Shaft Type and Lengths

F-Type



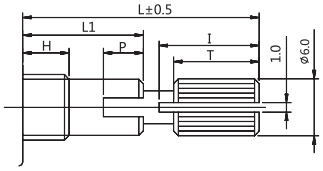
H	Bushing Length H=5								H=7			Bushing Length H=10			
Code	1	2	3	4	5	6	7	8	1	2	3	1	2	3	4
L	15	15	17.5	20	20	20	21.8	25	22.5	25	25	25	28	30	35
L1	10	10	10	10	10	10	13	15	15	15	15	17	17	20	25
P	4	4	4	4	4	4	5	5	5	5	5	5	5	5	5
F	4.5	5	5	6	8	9	6	7	6	7	8	6	8	8	8

S-Type



Bushing Length H=5		
Code	1	2
L	20	20
L1	10	11
P	4	5
I	7	7

Q-Type

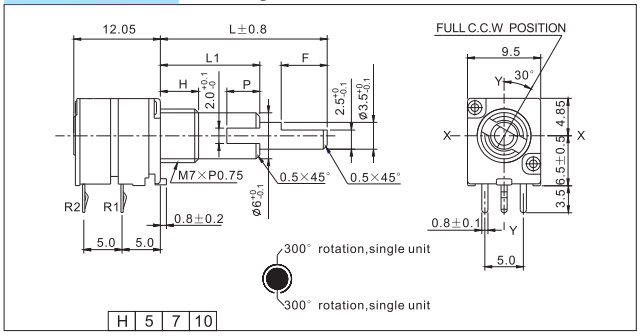


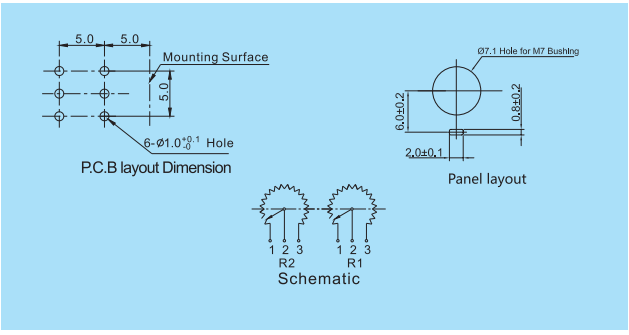
Bushing Length H=5					
Code	L	L1	P	T	I
1	20	10	4	6	7

Note 2: Full C.CW Shaft Position:

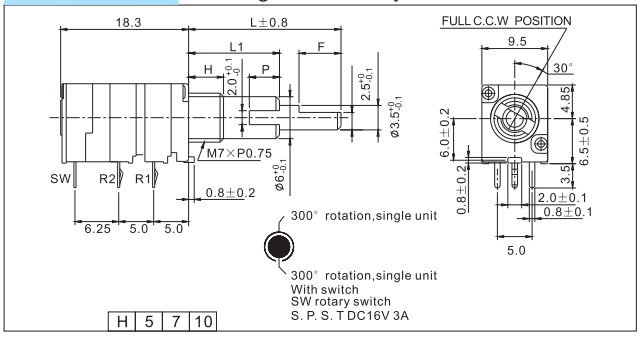
F-Type Shaft		Q/S-Type Shaft
C. Full C.C.W Position 30°	D. 30° Full C.C.W Position	C. Full C.C.W Position 30°

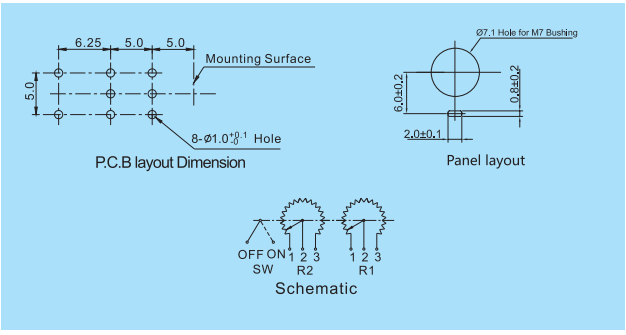
F092-2□N 2 Gangs, No Switch



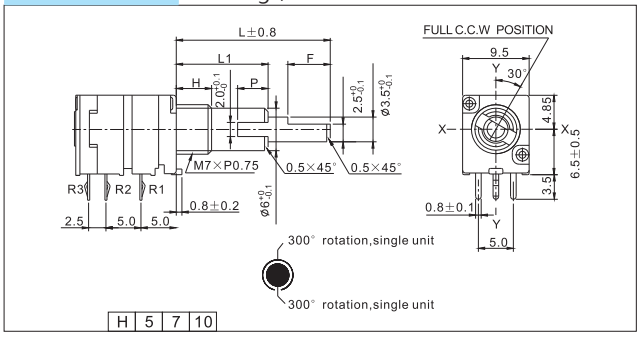


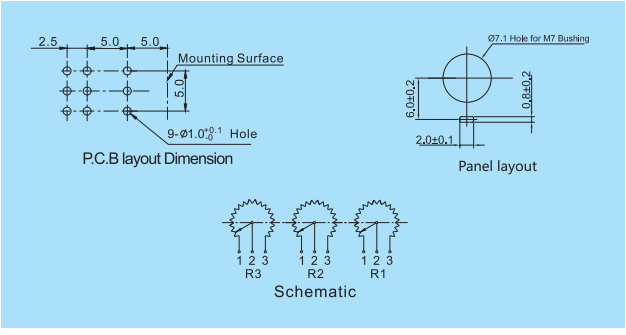
F092-2□S 2 Gangs, with Rotary Switch.



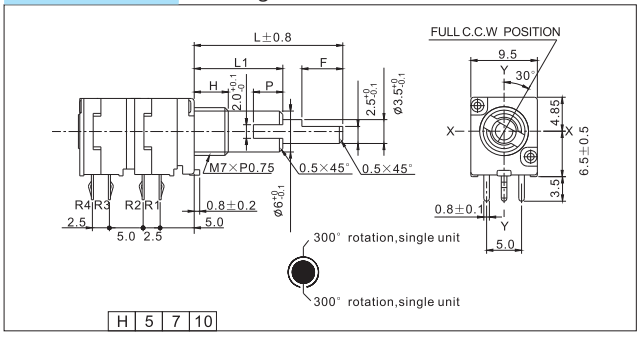


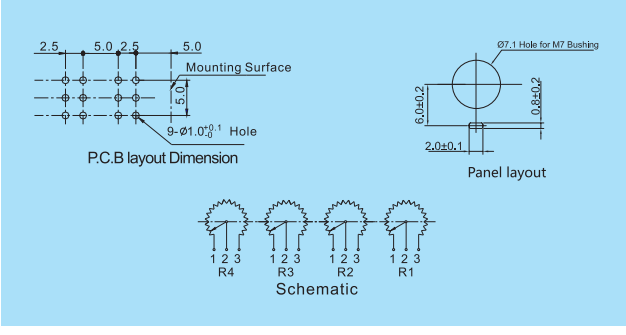
F092-3□N 3 Gangs, No Switch





F092-4□N 4 Gangs, No Switch





F093 Series Metal Shaft Potentiometer

Feature

1. Snap-in structure assures easy mounting.
2. Closed structure improves dust flux resistance.
3. Inserting molding around the metal shaft with resin.
4. Long life type available.

F093 Series Rotary Potentiometer.

Application:

- Wireless Intercom
- Car Stereo
- Wireless Equipment
- Video Machine

Electrical Characteristics

Total Resistance	1KΩ~1MΩ
Total Resistance Tolerance	500Ω<R<1MΩ: ±20%; R≤500Ω or R≥1MΩ: ±30%
Resistance Taper	A, B, C
Max. Operating Voltage	AC 50V, DC 10V
Rated Power	Linear Taper B: 0.05W Other Tapers B: 0.025W
Rotational Noise	100mv Max.
Insulation Resistance	More than 100MΩ at DC250V
Withstand Voltage	1 minute at AC 300V
Residual Resistance	Term.1~2: less than 20Ω Term.2~3: less than 20Ω
Gang Error (Dual Unit)	-40dB~0dB±3dB

Mechanical Characteristics

Total Rotational Angle	300° ±10°
Rotational Torgue	0.5~9mN·m
Click Torgue	5~20mN·m
Stopper Strength	300mN·m Min.
Push-Pull Strength	60N Min.

Durability

Rotational Life	Standard Life: 15,000 cycles Long Life: 100,000 cycles
Operating Temperature Range	-10° C~+70° C

HOW TO ORDERD

F093-	2	5	1	Q	1	C	B	100K	1

Model Series

Gang Number
- 1: 1 Gang
- 2: 2 Gangs
- 4: 4 Gangs
- 6: 6 Gangs

Length of Bushing
- 5: 5.0mm

Shaft Detent Option
- 0: No Shaft Detent
- 1: With Center Detent
- 2: With 11 Shaft Detents
- 3: With 21 Shaft Detents
- 4: With 41 Shaft Detents

Shaft Type & Length
- See Note 1

Full CCW Position
- See Note 2

Resistance Taper
- A: Audio (15A)
- B: Linear, (Single Unit: 1B; Dual & Mulit-gangs: 3B)
- C: Reverse Audio(15C)
- D: Audio(10A)

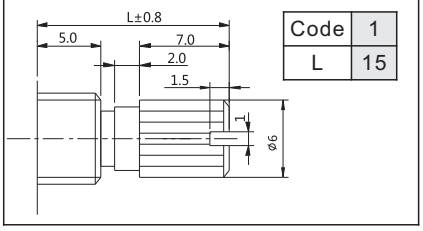
Total Resistance

1K	10K
2K	20K
5K	50K
100K	
200K	
500K	
1MEG	

Operation Life
- (Blank): Std Life w/o Anti-sulfur
- 1: Std Life w/Anti-sulfur
- 2: Long Life w/ Anti-sulfur
- 3: Long Life w/o Anti-sulfur

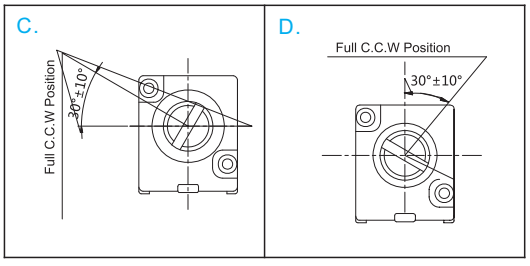
Note 1: Shaft Type and Lengths

Q-Type

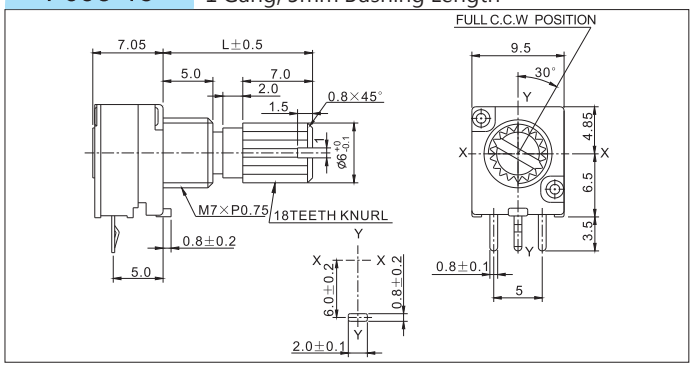


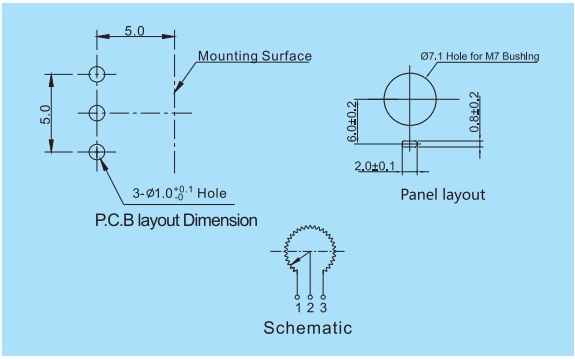
Code	1
L	15

Note 2: Full C.CW Shaft Position:

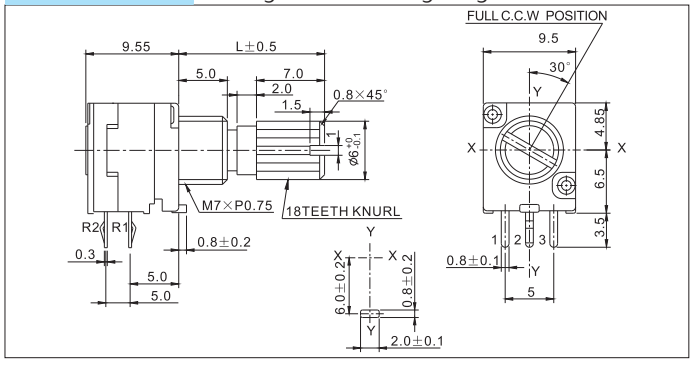


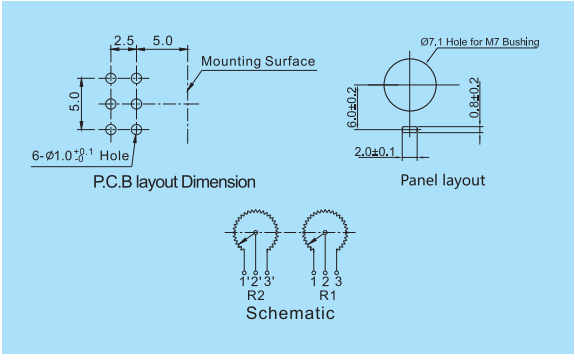
F093-15 1 Gang, 5mm Bushing Length



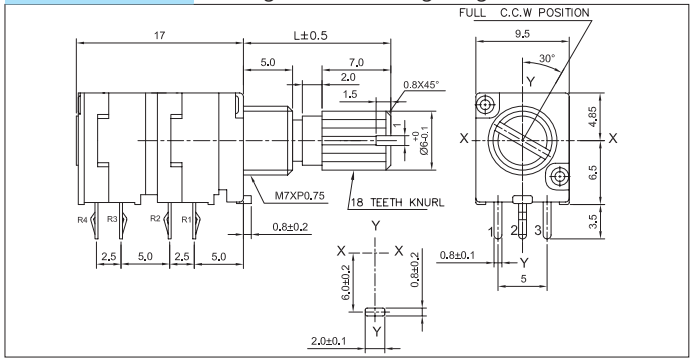


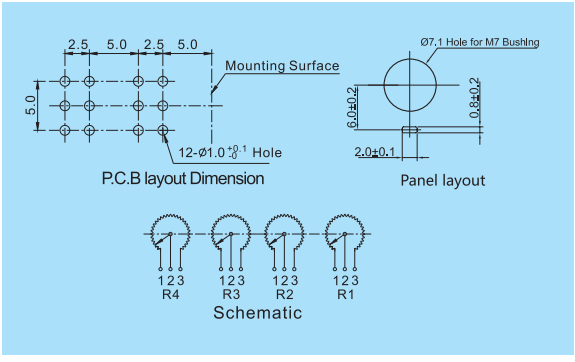
F093-25 2 Gangs, 5mm Bushing Length



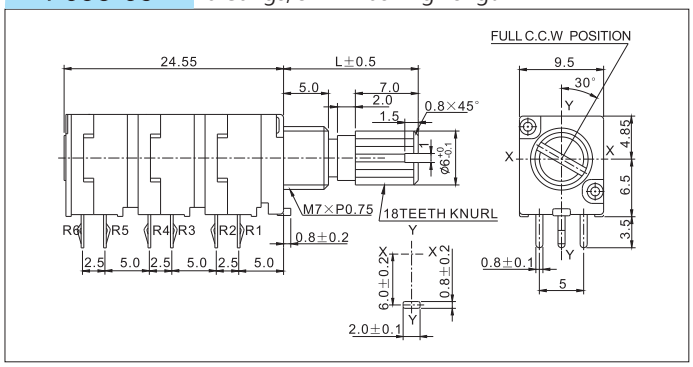


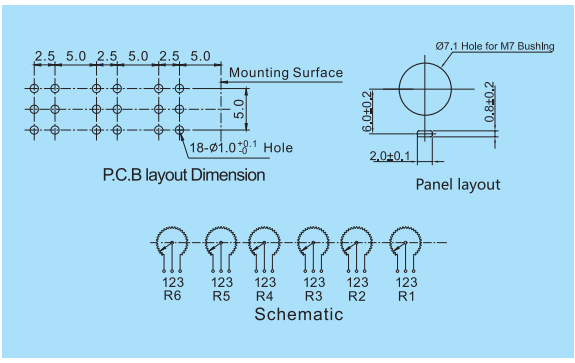
F093-45 4 Gangs, 5mm Bushing Length



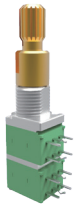


F093-65 6 Gangs, 5mm Bushing Length





F094 Series Metal Shaft Potentiometer



Feature

1. Flux builded-up preverntion is taken through inserting molding around the resistor with resin.
2. A large variety of products lined up to support various applications.
3. With dual shaft adjustment.
4. Long life type available.

F092 Series Rotary Potentiometer.

Application:

- Wireless Intercom
- Car Stereo
- Wireless Equipment
- Video Machine

Electrical Characteristics

Total Resistance	1KΩ~1MΩ
Total Resistance Tolerance	500Ω<R<1MΩ: ±20%; R≤500Ω or R≥1MΩ: ±30%
Resistance Taper	A, B, C
Max. Operating Voltage	AC 50V, DC 10V
Rated Power	Linear Taper B: 0.05W Other Tapers : 0.025W
Rotational Noise	100mv Max.
Insulation Resistance	More than 100MΩ at DC250V
Withstand Voltage	1 minute at AC 300V
Residual Resistance	Term.1~2: Less than 20Ω Term.2~3: Less than 20Ω

Mechanical Characteristics

Total Rotational Angle	300° ±10°
Rotational Torgue (Outer Shaft)	0.5~9mN·m
Rotational Torgue (Inner Shaft)	0.3~6mN·m
Click Torgue	5~20mN·m
Rotational Stopper Strength	300mN·m Min.
Push-pull Strength	60N Min.

Durability

Rotational Life	Standard Life: 15,000 cycles Long Life: 100,000 cycles
Operating Temperature Range	-10° C~+70° C

Switch Characteristics

Switch Rated Power	0.5A at DC 12V
Contact Resistance	Less than 100 mΩ
Switch Angle	50° Max.
Switch Torque	50 mN·m Max.
Switch Life	15,000 cycles

HOW TO ORDERD

F094-	2	7	S	1	1	F	1	C	B	100K	1

Model Series

Gang Number
- 2: 2 Gangs
- 3: 3 Gangs
- 4: 4 Gangs

Length of Bushing
- 7: 7.0mm

Swith Type
- N: No Switch
- S: Rotary Switch

Inner Sharft / Outer Sharft

Detent Option
- 0: No Shaft Detent
- 1: With Shaft Center Detent

Shaft Type & Length
- See Note 1

Full CCW Position
- See Note 2

Resistance Taper
- A: Audio (15A)
- B: Linear, (3B)
- C: Reverse Audio(15C)
- D: Audio(10A)

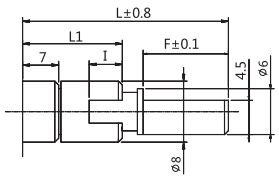
Total Resistance

1K	10K
2K	20K
5K	50K
100K	
200K	
500K	
1MEG	

Operation Life
- (Blank): Std Life w/o Anti-sulfur
- 1: Std Life w/Anti-sulfur
- 2: Long Life w/ Anti-sulfur
- 3: Long Life w/o Anti-sulfur

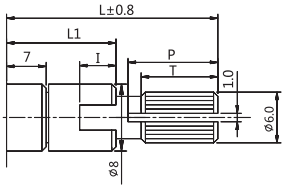
Note 1: Shaft Type and Lengths

F-Type



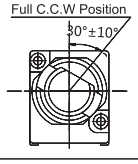
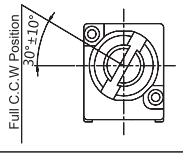
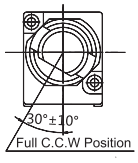
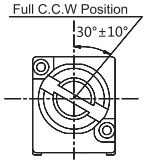
Code	1
L	30
L1	15
F	12
I	5

Q-Type

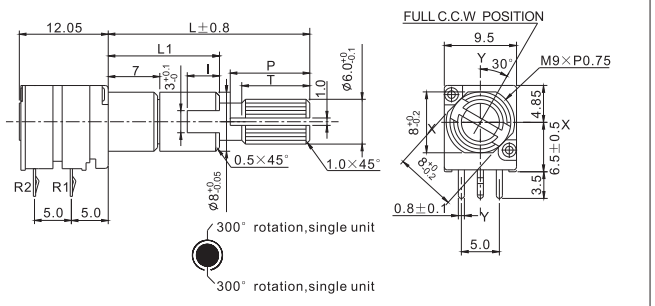


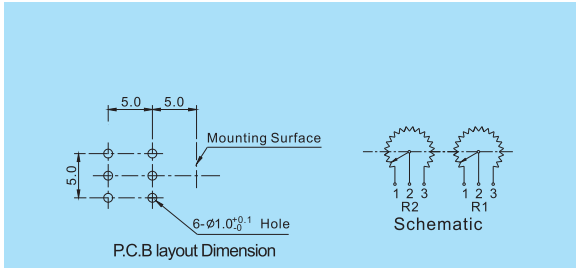
Code	1	2	3
L	25	30	30
L1	15	15	20
P	9	9	9
T	8	8	8
I	5	5	5

Note 2: Full C.CW Shaft Position:

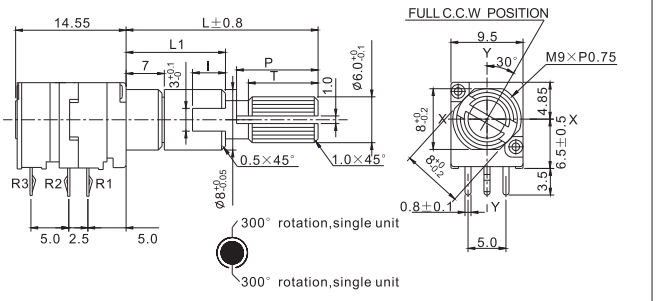
F-Type Shaft	Q-Type Shaft
C. 	A. 
D. 	C. 

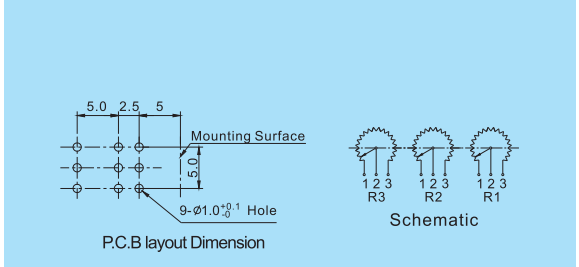
F094-27N Side Adjust, Dual Shaft, 2 Gangs, Center Detent Available



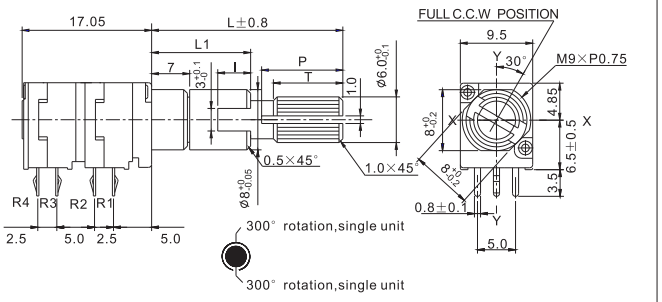


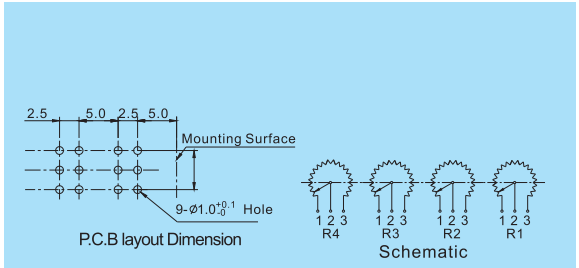
F094-37N Side Adjust, Dual Shaft, 3 Gangs, Center Detent Available



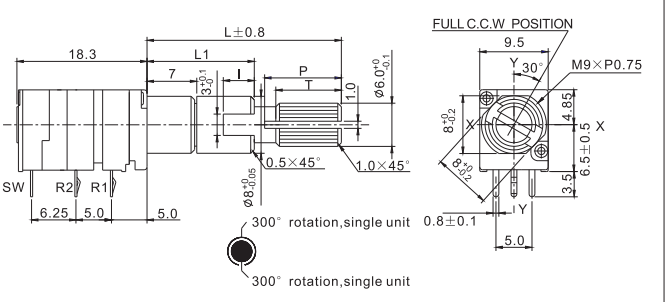


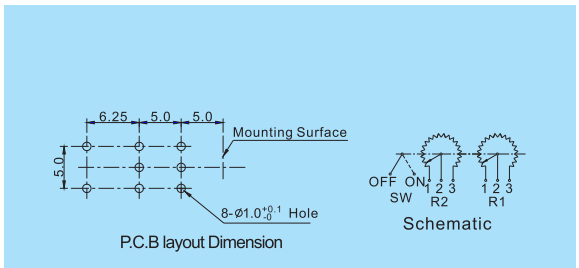
F094-47N Side Adjust, Dual Shaft, 4 Gangs, Center Detent Available



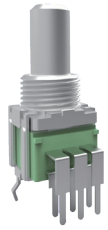


F094-27S Side Adjust, Dual Shaft, 2 Gangs, with Rotary Switch, Center Detent Available





F095 Series Metal Shaft Potentiometer



Feature

1. Snap-in structure assures easy mounting.
2. Closed structure improves dust flux resistance.
3. With frame mounting.
4. Long life type available.

F095 Series Rotary Potentiometer.

Application:

- Wireless Intercom
- Car Stereo
- Wireless Equipment
- Video Machine

Electrical Characteristics

Total Resistance	1KΩ~1MΩ
Total Resistance Tolerance	500Ω<R<1MΩ: ±20%; R≤500Ω or R≥1MΩ: ±30%
Resistance Taper	A, B, C
Max. Operating Voltage	AC 50V, DC 10V
Rated Power	Linear Taper B: 0.05W Other Tapers : 0.025W
Rotational Noise	100mv Max.
Insulation Resistance	More than 100MΩ at DC250V
Withstand Voltage	1 minute at AC 300V
Gang Error (Dual Unit)	-40dB~0dB±3dB
Residual Resistance	Term.1~2: less than 20Ω Term.2~3: less than 20Ω

Mechanical Characteristics

Total Rotational Angle	300° ±10°
Rotational Torgue	2~10mN·m
Click Torgue	5~20mN·m
Stopper Strength	500mN·m Min.
Push-pull Strength	100N Min.

Durability

Rotational Life	Standard Life: 15,000 cycles Long Life: 100,000 cycles
Operating Temperature Range	-10° C~+70° C

HOW TO ORDERD

F095-	H	5	G	1	A	1	C	B	100K	1

Model Series

Terminal Configuration
- V: Side Adjust, PC Pins
- H: Top Adjust, PC Pins

Length of Bushing
- 5: 5.0mm
- 7: 7.0mm

Gang Number
- N: Single Gang
- G: Dual Gangs

Shaft Detent Option
- 0: No Shaft Detent
- 1: With Center Detent

Shaft Type & Length
- See Note 1

Full CCW Position
- See Note 2

Resistance Taper
- A: Audio (15A)
- B: Linear, (Single Unit: 1B; Dual & Mulit-gangs: 3B)
- C: Reverse Audio(15C)
- D: Audio(10A)

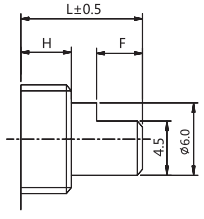
Total Resistance

1K	10K
2K	20K
5K	50K
100K	
200K	
500K	
1MEG	

Operation Life
- (Blank): Std Life w/o Anti-sulfur
- 1: Std Life w/Anti-sulfur
- 2: Long Life w/Anti-sulfur
- 3: Long Life w/o Anti-sulfur

Note 1: Shaft Type and Lengths

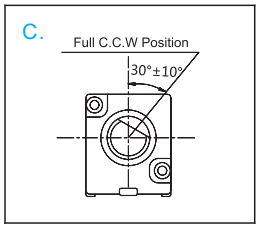
A-Type



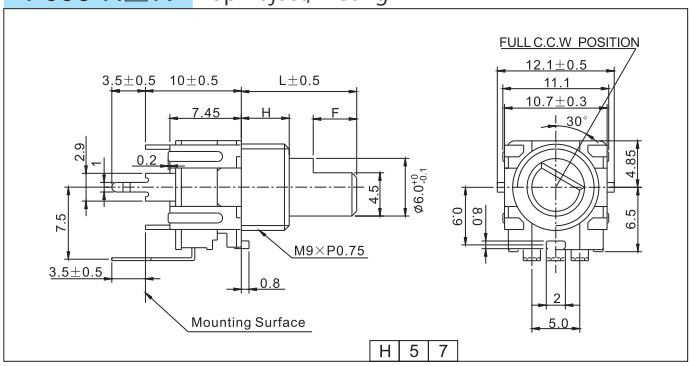
Bushing Length H=5							
Code	1	2	3	4	5	6	7
L	12.5	15	17.5	20	20	25	30
F	7	7	7	7	12	12	12

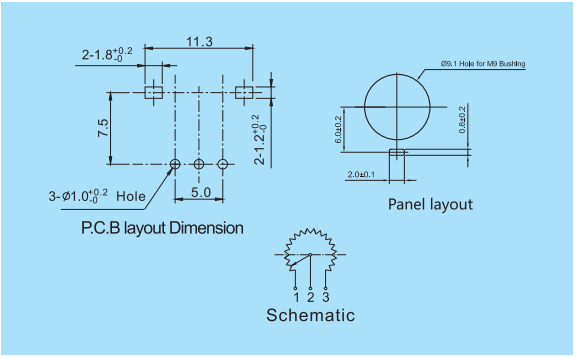
Bushing Length H=7						
Code	1	2	3	4	5	6
L	15	17.5	20	20	25	30
F	7	7	7	12	12	12

Note 2: Full C.CW Shaft Position:

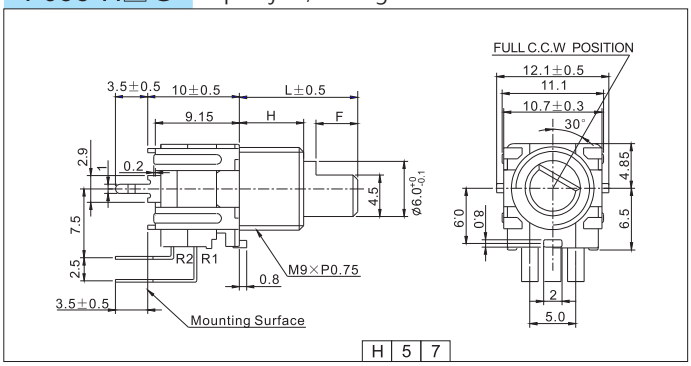


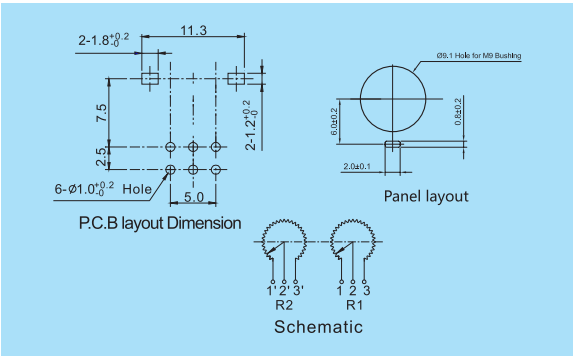
F095-H□N Top Adjust, 1 Gang



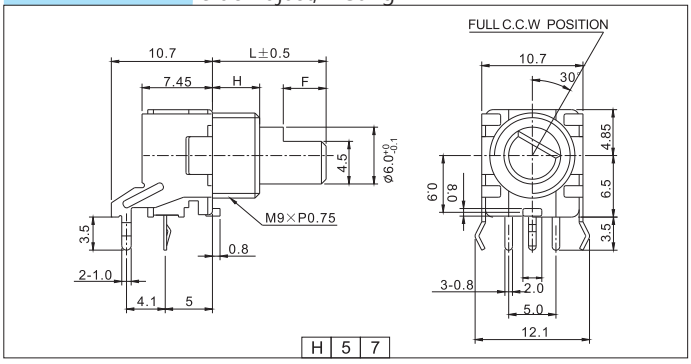


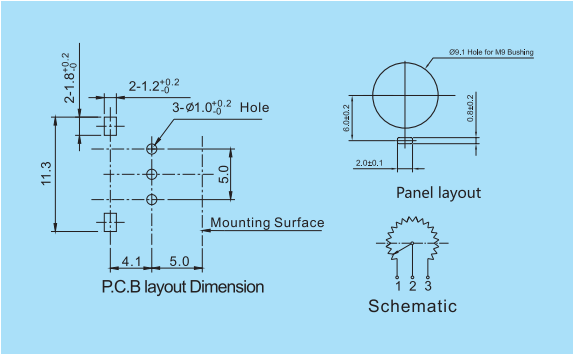
F095-H□G Top Adjust, 2 Gangs



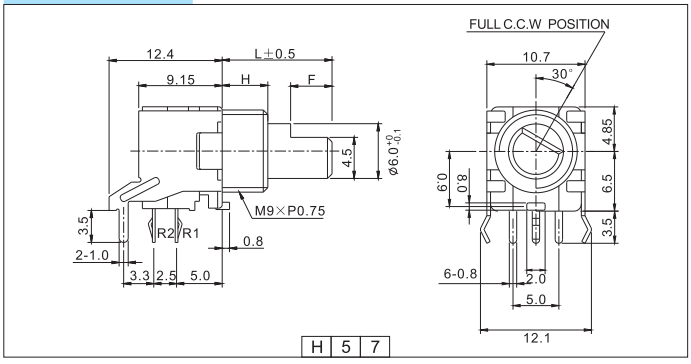


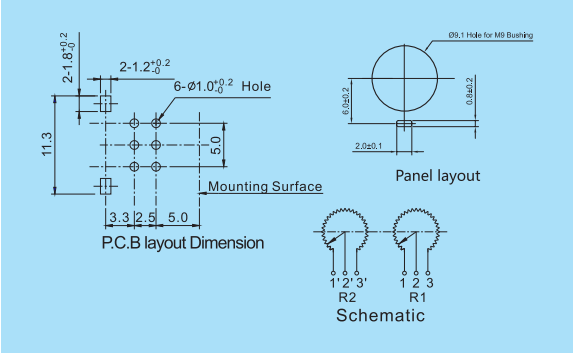
F095-V□N Side Adjust, 1 Gang



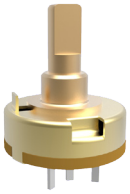


F095-V□G Side Adjust, 2 Gangs





F131K Series Metal Shaft Potentiometer



Feature

1. Metal shaft style.
2. Carbon element.
3. Wide range of resistance tapers.
4. Assorted pin layout.
5.Long life type available.

F131K Series Rotary Potentiometer.

Application:

- Game Machine
- Car Stereo
- Audio
- Model Airplane Server

Electrical Characteristics

Total Resistance	1KΩ~1MΩ
Total Resistance Tolerance	500Ω<R<1MΩ: ±20%; R≤500Ω or R≥1MΩ: ±30%
Resistance Taper	A, B, C
Max. Operating Voltage	Linear Taper B: AC 200V Other Tapers: AC 100V
Rated Power	Linear Taper B: 0.1W Other Tapers : 0.04W
Rotational Noise	Less than 300mV
Residual Resistance	Term.1~2: Less than 3% of Total Resistance Term.2~3: Less than 3% of Total Resistance

Mechanical Characteristics

Total Rotational Angle	220° ±5°
Rotational Torgue	0.5~7mN·m
Stopper Strength	300mN·m Min.
Push-pull Strength	50N Min.

Durability

Rotational Life	Standard Life: 100,000 cycles Long Life: 1,000,000 cycles
Operating Temperature Range	-10° C~+70° C

HOW TO ORDERD

F131K-	F	1	C	B	100K	1	T0

Model Series

Shaft Type & Length
See Note 1

Full CCW Position
See Note 2

Resistance Taper

A: Audio (15A)
B: Linear, (0B)
C: Reverse Audio(15C)
D: Audio(10A)

Total Resistance

1K	2K	5K
10K	20K	50K
100K	200K	
500K	1MEG	

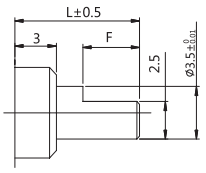
Operation Life

(Blank):Std Life w/o Anti-sulfur
1:Std Life w/Anti-sulfur
6:Long Life w/Anti-sulfur
7:Long Life w/o Anti-sulfur

D0	E0	F0	F4	G0	J0	M0	R0	S0	T0
60°	70°	80°	84°	90°	120°	150°	200°	210°	220°

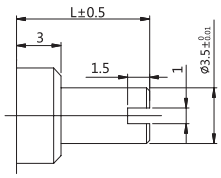
Note 1: Shaft Type and Lengths

F-Type



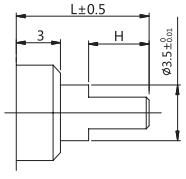
Code	1	2	3
L	10	15	20
F	5	7	7

S-Type



Code	1	2
L	7	14

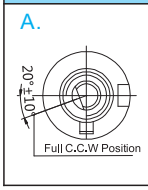
H-Type

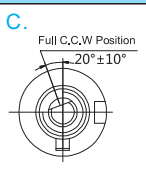


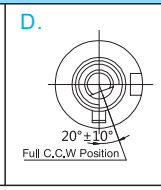
Code	1	2	3
L	10	15	21
H	5	5	7

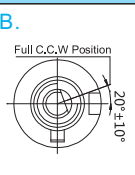
Note 2: Full C.CW Shaft Position:

F-Type Shaft

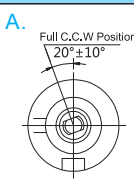


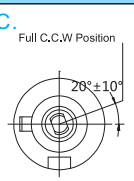




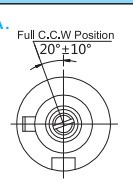


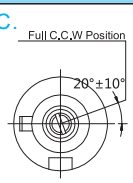
H-Type Shaft





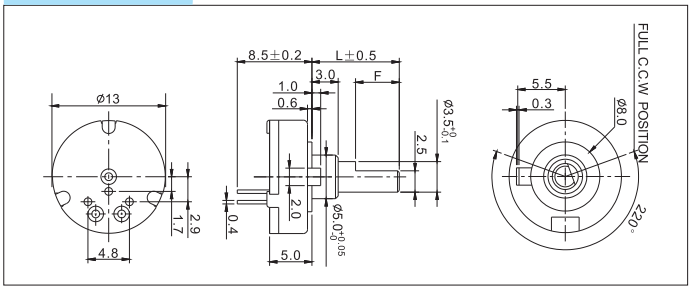
S-Type Shaft

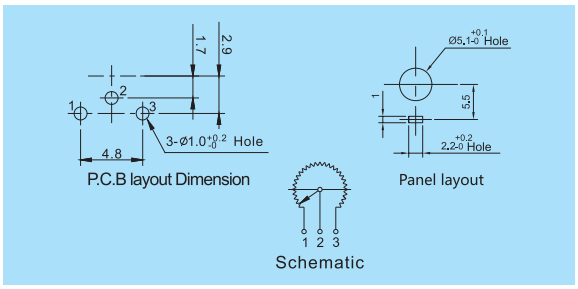




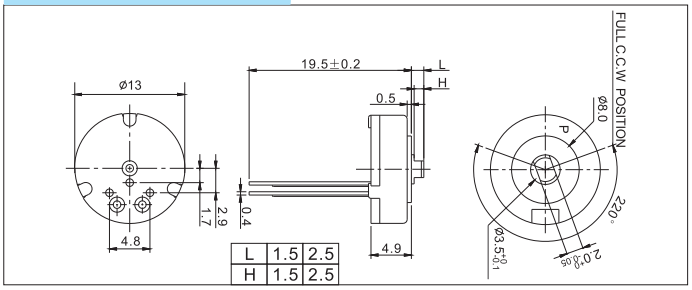
F131K Series Metal Shaft Potentiometer

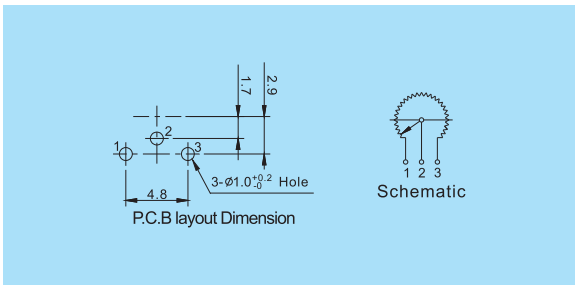
F131K-F Top Adjust, 1 Gang, F-Type Shaft



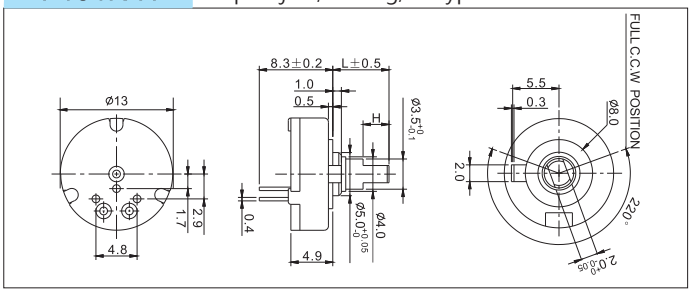


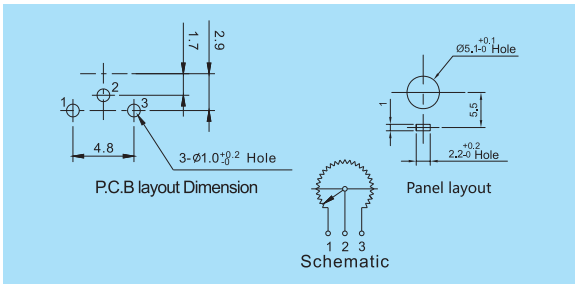
F131K-Customized Customized Shaft, Short Bushing and Terminal Length L=19.5



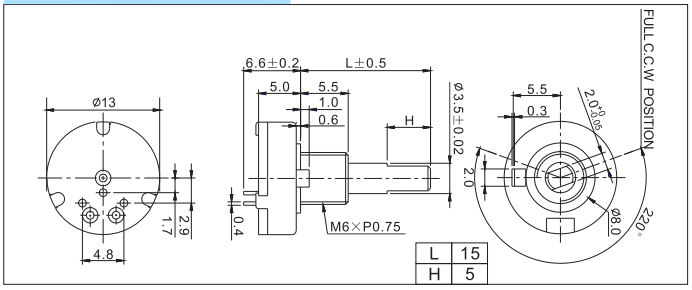


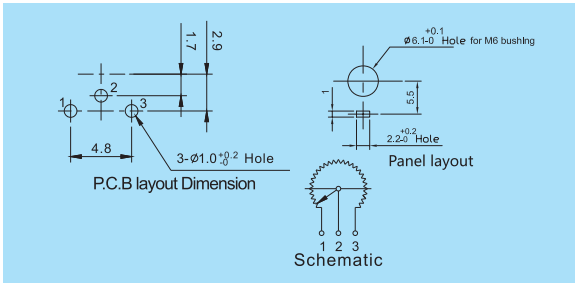
F131K-H Top Adjust, 1 Gang, H-Type Shaft



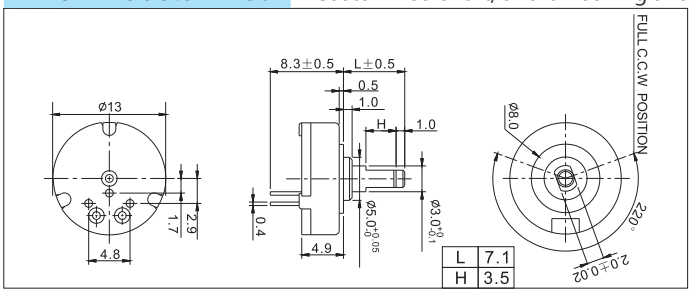


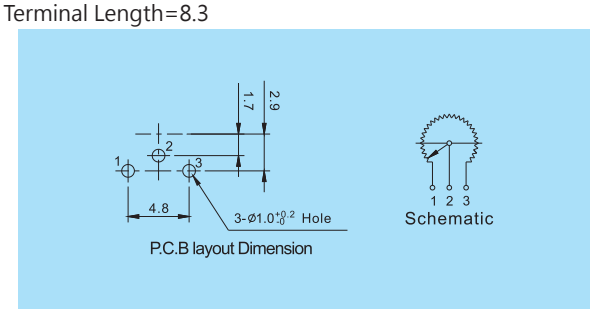
F131K-Customized Customized H Shaft, Threaded Bushing and Terminal Length



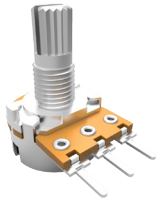


F131K-Customized Customized Shaft, Short Bushing and Terminal Length=8.3





F16K Series Metal Shaft Potentiometer



Feature

1. Metal shaft style.
2. Carbon film element.
3. Wide range of resistance tapers.
4.Long life type available.

F16K Series Rotary Potentiometer.

Application:

- Lamps
- Audio
- Car Stereo
- Electrical Appliances

Electrical Characteristics

Total Resistance	1KΩ~1MΩ
Total Resistance Tolerance	500Ω<R<1MΩ: ±20%; R≤500Ω or R≥1MΩ: ±30%
Resistance Taper	A, B, C
Max. Operating Voltage	Linear Taper B: AC 200V Other Tapers : AC 150V
Rated Power	Linear Taper B: 0.2W Other Tapers B: 0.1W
Rotational Noise	100mV Max.
Insulation Resistance	More than 100MΩ at DC500V
Withstand Voltage	1 minute at AC 500V
Residual Resistance	Term.1~2: Less than 20Ω Term.2~3: Less than 20Ω
Gang Error (Dual Unit)	-40dB~0dB±3dB

Mechanical Characteristics

Total Rotational Angle	300° ±5°
Rotational Torgue	2~10mN·m
Stopper Strength	700mN·m Min.
Push-pull Strength	80N Min.
Click Torgue	10~30mN·m
Bushing & Nut Tight Strength	800mN·m Min.

Switch Characteristics

Switch Circuit	S.P.S.T.
Contact Resistance	Less than 50 mΩ
Rated Power	Single Unit: 1.0A at AC/DC 12V
Rotational Angle	35° ±10°
Switch Torque	7-25 mN·m
Switch Life	15,000 cycles

Durability

Rotational Life	Standard Life: 15,000 cycles Long Life: 1,000,000 cycles
Operating Temperature Range	-10° C~+70° C

HOW TO ORDERD

F16K-	G	P	3	Q	1	C	B	100K	1

Model Series

Gang Number
1: 1 Gang
2: 2 Gangs
4: 4 Gangs
6: 6 Gangs
S: Single Gang with Rotary Switch (Switch Terminal at Bottom)
M: Single Gang with Momentary Switch
H: Single Gang with Rotary Switch (Switch Terminal at Side)

Terminal Configuration (See Note 3)

V: Side Adjust, PC Pins
P: Top Adjust, Solder Lugs
D: Rear Adjust, PC Pins
H: Top Adjust, PC Pins

Shaft Type & Length

See Note 1

Full CCW Position

See Note 2

Detent Option

0: No Detent
1: Center Detent
2: 11 Detents
3: 21 Detents
4: 41 Detents

Resistance Taper

A: Audio (15A)
B: Linear, (Single Unit: 1B; Dual & Mulit-gangs: 3B)
C: Reverse Audio(15C)
D: Audio(10A)

Total Resistance

1K	10K
2K	20K
5K	50K
100K	
200K	
500K	
1MEG	

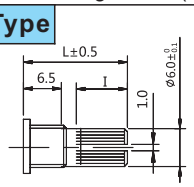
Operation Life

(Blank): Std Life w/o Anti-sulfur
1: Std Life w/ Anti-sulfur
2: Long Life w/ Anti-sulfur(Multi Gangs)
3: Long Life w/o Anti-sulfur (Multi Gangs)
6: Long Life w/ Anti-sulfur(1 Gang)
7: Long Life w/o Anti-sulfur(1 Gang)

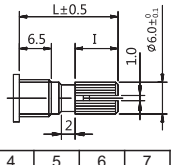
Note 1: Shaft Type and Lengths

(1)Die-Casting Shaft: (for 1, 2 Gangs)

Q-Type

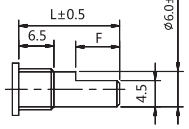


Code	1	2	3
L	12	15	20
I	4.5	6.5	11.5



Code	4	5	6	7
L	25	30	15	20
I	14	19	6	10
M	2	2	1	2

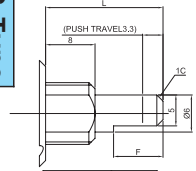
A-Type



Code	1	2	3
L	15	20	25
F	7	12	12

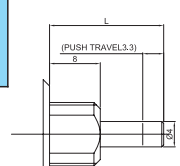
(3)Plastic Shaft: (for Momentary Switch Type)

C-Type



Code	1
L	19
F	8

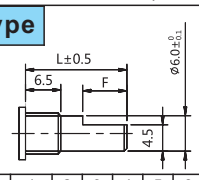
D-Type



Code	1
L	18

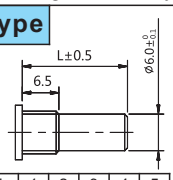
(2)Machined Shaft: (for 1, 2, 4, 6 Gangs or Rotary Switch Type)

F-Type



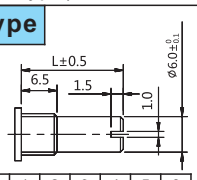
Code	1	2	3	4	5	6
L	10.5	15	20	25	30	35
F	3.5	7	12	12	12	12

R-Type



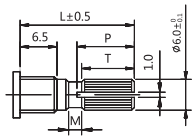
Code	1	2	3	4	5
L	15	20	25	30	35

S-Type



Code	1	2	3	4	5	6
L	10	15	20	25	30	35

Q-Type

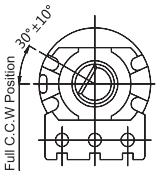


Code	1	2	3	4	5	6
L	10	15	20	25	30	35
P	2.5	7	12	14	14	14
T	2.5	6	10	12	12	12
M	1	1	2	2	4	4

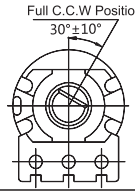
Note 2: Full C.CW Shaft Position:

F-Type Shaft

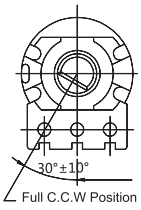
A.



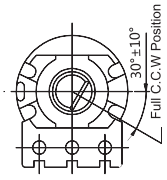
C.



D.

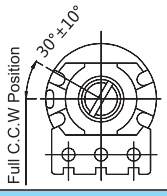


B.

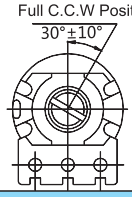


Q/S-Type Shaft

A.

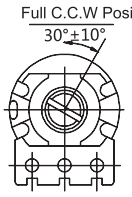


C.



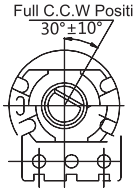
B-Type Shaft

C.

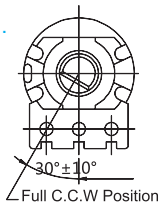


A-Type Shaft

C.

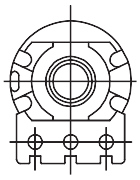


D.

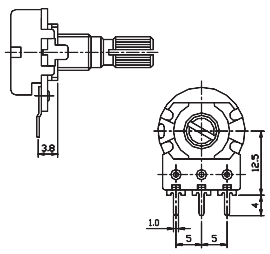
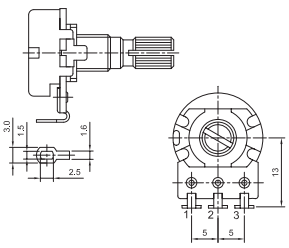
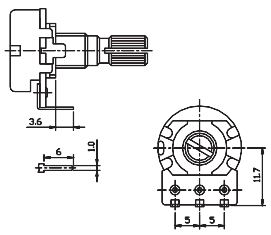
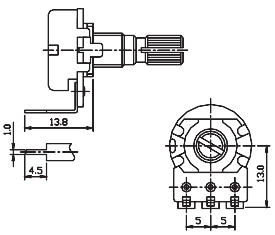
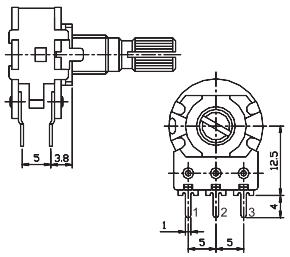
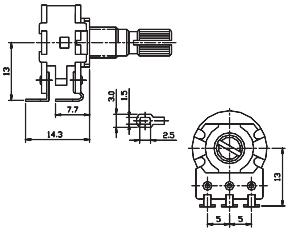
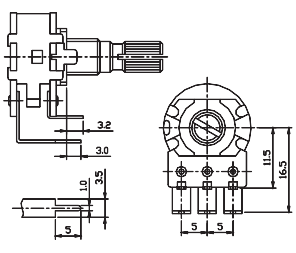
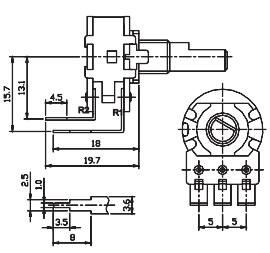


R-Type Shaft

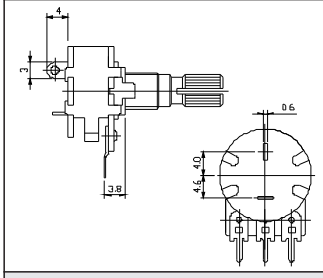
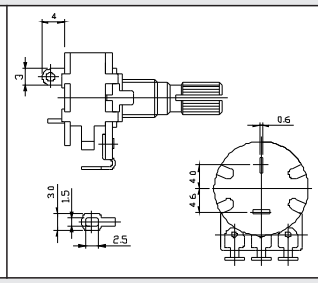
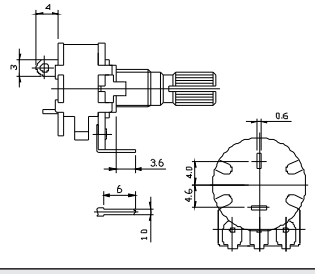
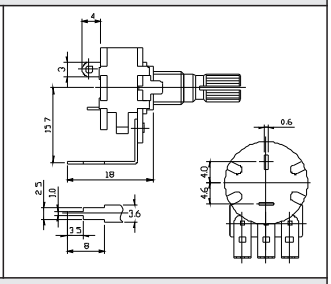
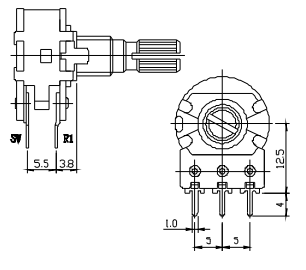
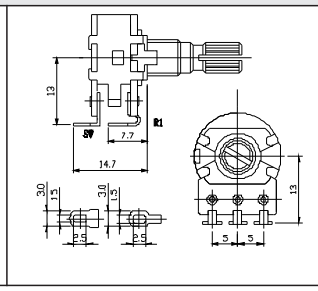
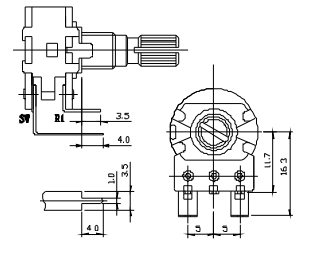
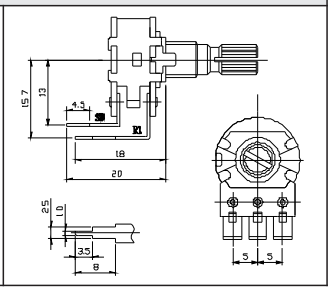
N.



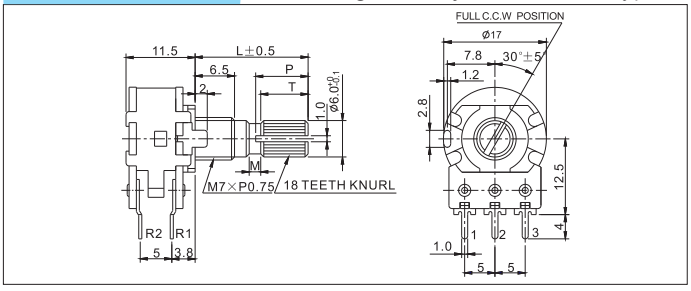
Note 3: Terminal Configuration:

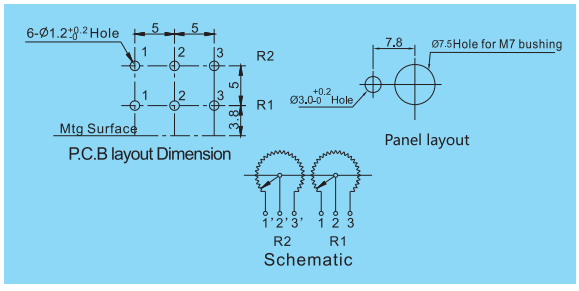
V-Type	P-Type	D-Type	H-Type
Single Gang:			
			
Dual Gangs:			
			

F16K Series Metal Shaft Potentiometer

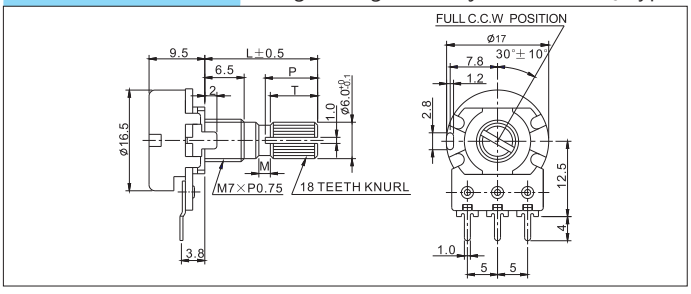
V-Type	P-Type	D-Type	H-Type
Single Gang with Rotary Switch : (Switch Terminal at Bottom)			
			
Single Gang with Rotary Switch : (Switch Terminal at Side)			
			

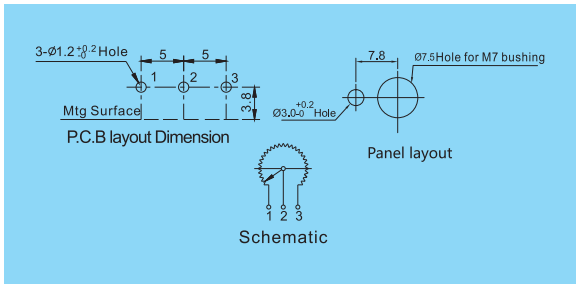
F16K-GV□Q□ Dual Gang, Side Adjust, PC Pins, Q-Type Shaft



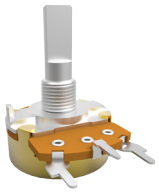


F16K-NV□Q□ Single Gang, Side Adjust, PC Pins, Q-Type Shaft





F24KM Series Metal Shaft Potentiometer



Feature

1. Metal shaft style.
2. Carbon film element.
3. Assorted pin layout.
4.Long Life Type Avaiable.

F24KM Series Rotary Potentiometer.

Application:

- lamps
- Audio
- Car Stereo
- Electrical Appliances

Electrical Characteristics

Total Resistance	1KΩ~1MΩ
Total Resistance Tolerance	500Ω<R<1MΩ: ±20%; R≤500Ω or R≥1MΩ: ±30%
Resistance Taper	A, B, C
Max. Operating Voltage	Linear Taper B: AC 500V Other Tapers: AC 250V
Rated Power	Linear Taper B: 0.5W Other Tapers: 0.25W
Rotational Noise	100mv Max.
Insulation Resistance	More than 100MΩ at DC500V
Withstand Voltage	1 minute at AC 1080V
Residual Resistance	Term.1~2: less than 10Ω Term.2~3: less than 10Ω

Mechanical Characteristics

Total Rotational Angle	300° ±10°
Rotational Torgue	2~15mN·m
Stopper Strength	500mN·m Min.
Push-pull Strength	100N Min.

Switch Characteristics

Switch Circuit	S.P.S.T.
Contact Resistance	Less than 50 mΩ
Rated Power	1.0A at AC/DC 125V
Switch Angle	50° ±10°
Switch Torque	30-80 mN·m
Switch Life	15,000 cycles

Durability

Rotational Life	Standard Life: 15,000 cycles Long Life: 100,000 cycles
Operating Temperature Range	-10° C~+70° C

HOW TO ORDERD

F24KM-	N	P	M	F	1	C	B	100K	1

Model Series

Swith Type
- N: No Switch
- S: Rotary Switch

Terminal Configuration
- V: Side Adjust, PC Pins
- P: Top Adjust, Solder Lugs
- H: Top Adjust, PC Pins
- See Note 3

Shaft Type & Length
- See Note 1

Bushing Material
- P: Plastic
- M: Metal

Full CCW Position
- See Note 2

Resistance Taper
- A: Audio (15A)
- B: Linear (1B)
- C: Reverse Audio(15C)
- D: Audio(10A)

Total Resistance

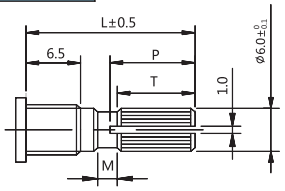
1K	2K
5K	10K
20K	50K
100K	200K
500K	1MEG

Operation Life
- (Blank): Std Life w/o Anti-sulfur
- 1: Std Life w/ Anti-sulfur
- 2: Long Life w/ Anti-sulfur (No Switch)
- 3: Long Life w/o Anti-sulfur (No Switch)

Note 1: Shaft Type and Lengths

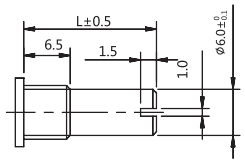
Machined Shaft:

Q-Type



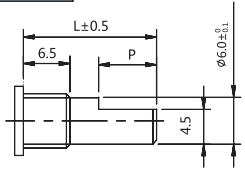
Code	1	2	3	4	5
L	15	20	25	30	35
P	7	12	14	14	14
T	6	10	12	12	12
M	1	2	2	4	4

S-Type



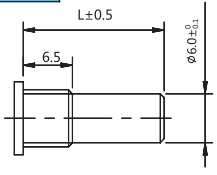
Code	1	2	3	4	5
L	15	20	25	30	35

F-Type



Code	1	2	3	4	5
L	15	20	25	30	35
F	7	12	12	12	12

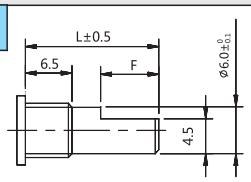
R-Type



Code	1	2	3	4	5
L	15	20	25	30	35

Die Casting Shaft:

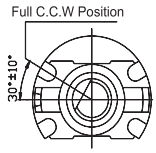
A-Type

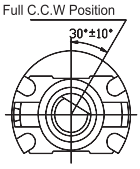


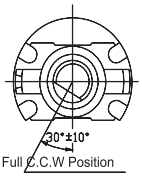
Code	1	2
L	15	25
F	7	12

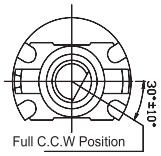
Note 2: Full C.CW Shaft Position:

F-Type Shaft

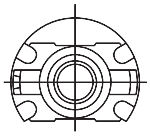
A.


C. Full C.C.W Position


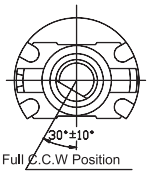
D.


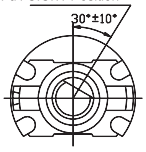
B.


R-Type Shaft

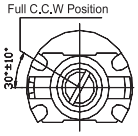
N.


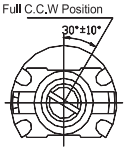
A-Type Shaft

D.


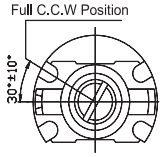
C. Full C.C.W Position


S-Type Shaft

A.


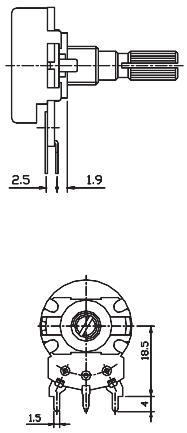
C.


Q-Type Shaft

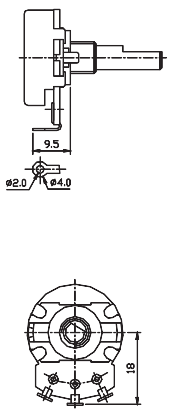
A.


Note 3: Terminal Configuration:

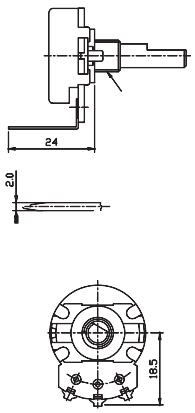
V-Type



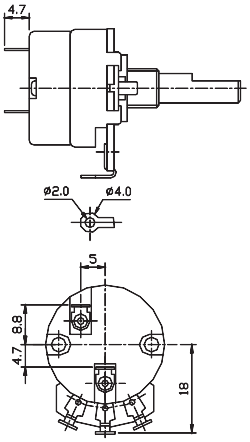
P-Type



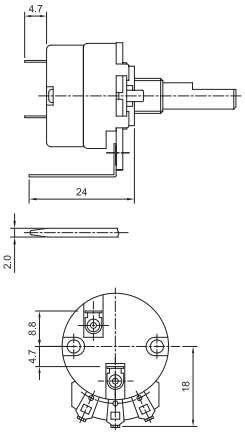
H-Type



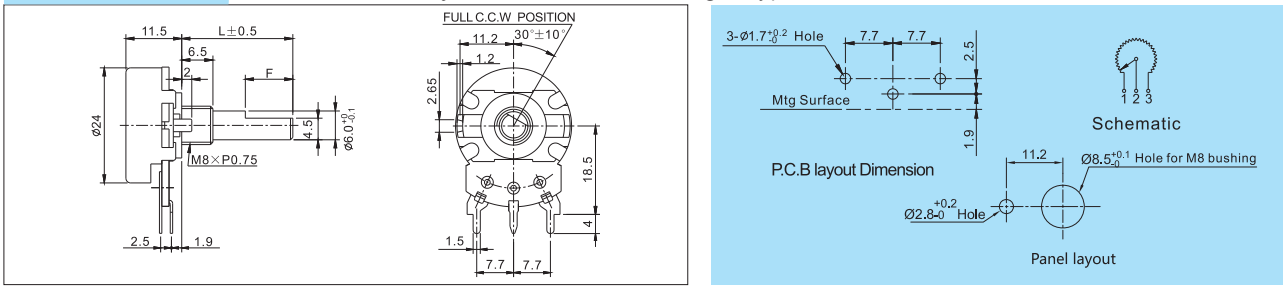
P-Type with Switch



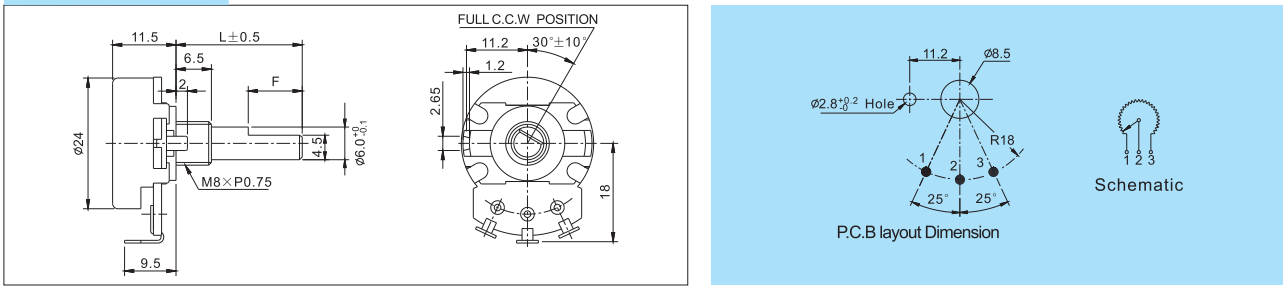
H-Type with Switch



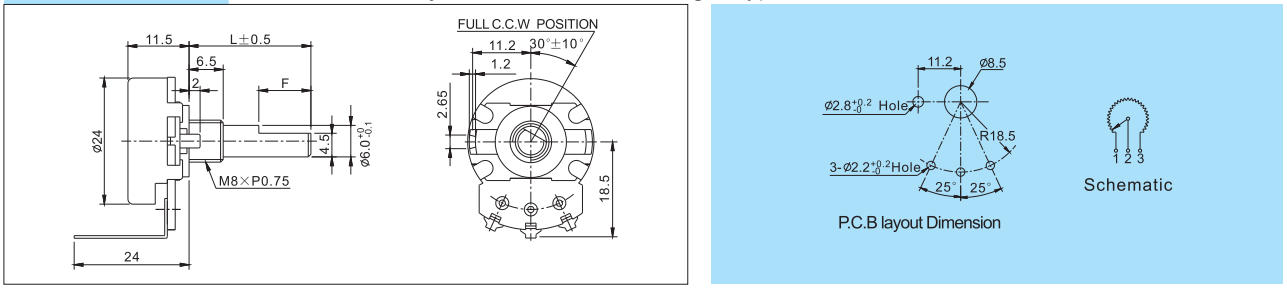
F24KM-NVMF
No Switch, Side Adjust, PC Pins, Metal Bushing, F-Type Shaft



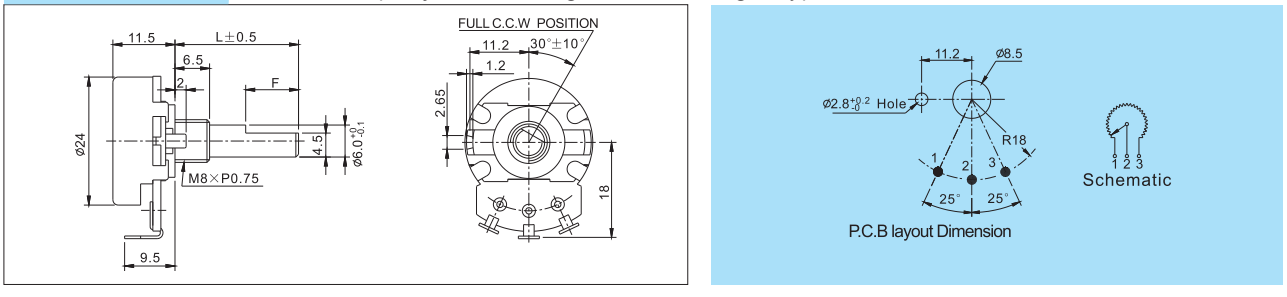
F24KM-NPMF
No Switch, Top Adjust, Solder Lugs, Metal Bushing, F-Type Shaft



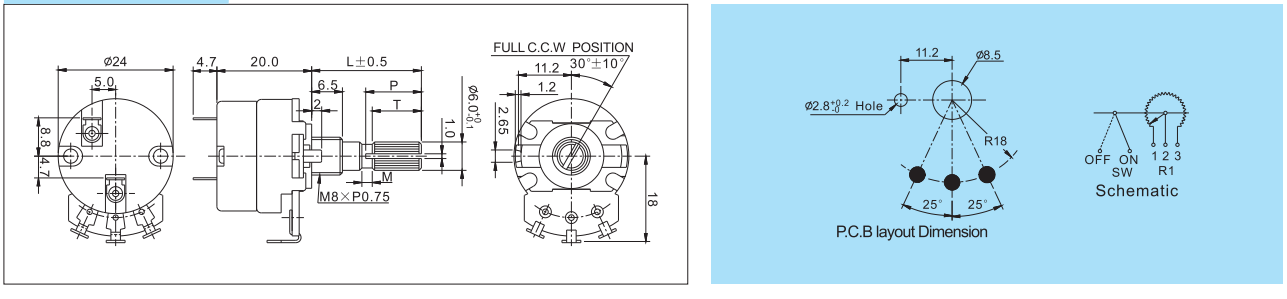
F24KM-NHMF
No Switch, Side Adjust, PC Pins, Metal Bushing, F-Type Shaft



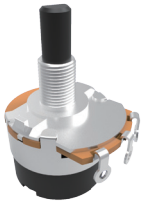
F24KM-NPPF
No Switch, Top Adjust, Solder Lugs, Plastic Bushing, F-Type Shaft



F24KM-SPMF
With Rotary Switch, Top Adjust, Solder Lugs, Metal Bushing, F-Type Shaft



F24KP Series Insulated Shaft Potentiometer



Feature

1. Insulated shaft style.
2. Carbon element.
3. Wide range of resistance tapers.
4.Long life type available.

F24KP Series Rotary Potentiometer.

Application:

- Lamps
- Dimmer
- Medical equipment
- Electrical Appliances

Electrical Characteristics

Total Resistance	1KΩ~1MΩ
Total Resistance Tolerance	500Ω<R<1MΩ: ±20%; R≤500Ω or R≥1MΩ: ±30%
Resistance Taper	A, B, C
Max. Operating Voltage	Linear Taper B: AC 500V Other Tapers : AC 250V
Rated Power	Linear Taper B: 0.5W Other Tapers : 0.25W
Rotational Noise	100mV Max.
Insulation Resistance	More than 100MΩ at DC500V
Withstand Voltage	1 minute at AC 1080V
Residual Resistance	Term.1~2: Less than 10Ω Term.2~3: Less than 10Ω

Mechanical Characteristics

Total Rotational Angle	300° ±10°
Rotational Torgue	2~15mN·m
Stopper Strength	500mN·m Min.
Push-pull Strength	100N Min.
Bushing & Nut Tight Strength	700mN·m Min.

Durability

Rotational Life	15,000 cycles
Operating Temperature Range	-10° C~+70° C

Switch Characteristics

Contact Resistance	Less than 50 mΩ
Rated Power	1.0A at AC/DC 125V
Rotational Angle	50° ±10°
Switch Torque	30-80 mN·m
Switch Life	15,000 cycles

HOW TO ORDERD

F24KP-	N	P	F	1	C	B	100K	1

Model Series

Swith Type
- N: No Switch
- S: Rotary Switch

Terminal Configuration
- P: Top Adjust, Solder Lugs
- See Note 3

Shaft Type & Length
- See Note 1

Full CCW Position
- See Note 2

Resistance Taper
- A: Audio (15A)
- B: Linear (1B)
- C: Reverse Audio(15C)
- D: Audio(10A)

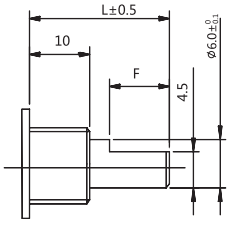
Total Resistance

1K	2K
5K	10K
20K	50K
100K	200K
500K	1MEG

Operation Life
- (Blank): Std Life w/o Anti-sulfur
- 1: Std Life w/ Anti-sulfur
- 2: Long Life w/ Anti-sulfur (No Switch)
- 3: Long Life w/o Anti-sulfur (No Switch)

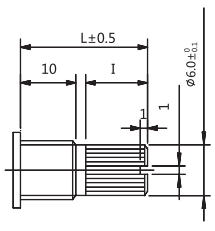
Note 1: Shaft Type and Lengths

F-Type



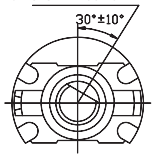
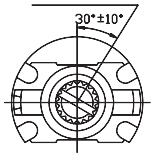
Code	1	2	3
L	15	20	25
F	5	10	12

Y-Type

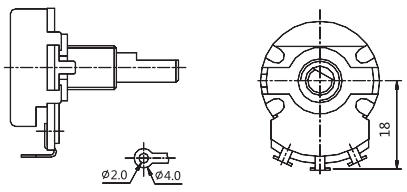
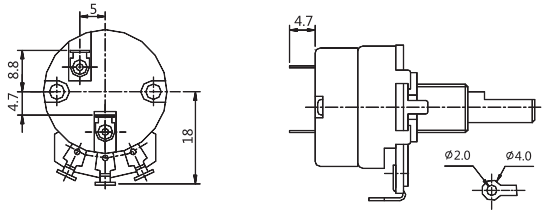


Code	1	2	3
L	15	20	25
I	5	10	12

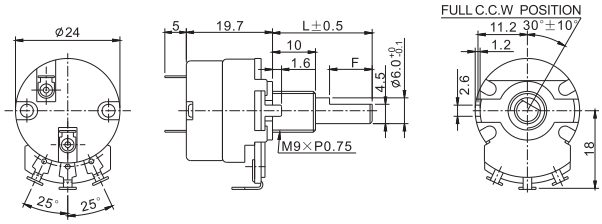
Note 2: Full C.CW Shaft Position:

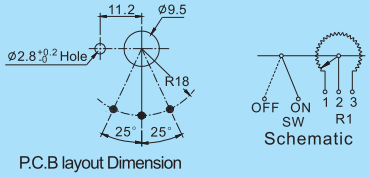
F-Type Shaft	Y-Type Shaft
C. Full C.C.W Position 	C. Full C.C.W Position 

Note 3: Terminal Configuration:

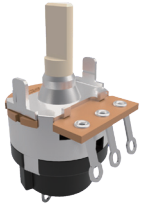
P-Type	P-Type with Switch
	

F24KP-SPF With Rotary Switch, PC Pins, F-Type Shaft





F24KSPP Series Insulated Shaft Potentiometer



Feature

1. Insulated shaft style.
2. Carbon element.
3. Push Lock Switch
4. Long life type available.

F24KSPP Series Rotary Potentiometer.

Application:

- Lamps
- Dimmer
- Medical equipment
- Electrical Appliances

Electrical Characteristics

Total Resistance	1KΩ~1MΩ
Total Resistance Tolerance	500Ω<R<1MΩ: ±20%; R≤500Ω or R≥1MΩ: ±30%
Resistance Taper	A, B, C
Max. Operating Voltage	Linear Taper B: AC 500V; Other Tapers : AC 250V
Rated Power	Linear Taper B: 0.5W; Other Tapers : 0.25W
Rotational Noise	100mV Max.
Insulation Resistance	More than 100MΩ at DC500V
Withstand Voltage	AC1500V/1mA/min(Metallic Case to Terminals) AC1080V/1mA/min(Switch Terminals)
Residual Resistance	Term.1~2: Less than 10Ω Term.2~3: Less than 10Ω

Mechanical Characteristics

Total Rotational Angle	300° ±10°
Rotational Torgue	5~20mN·m
Stopper Strength	500mN·m Min.
Push-pull Strength	100N Min.

Switch Characteristics

Contact Resistance	Less than 50 mΩ
Rated Power	6.0A at AC 125V
The Length of Stroke (Push-push Switch)	5.0±0.5mm
Operating Force of Switch(Push-push Switch)	80-200 mN·m
Switch Life	15,000 cycles

Durability

Rotational Life	15,000 cycles
Operating Temperature Range	-10° C~+70° C

HOW TO ORDERD

F24KSPP-	1	F	1	B	100K	1

Model Series

Switch Terminal Configuration

1: 2 Switch Terminals(S.P.S.T)
1: 3 Switch Terminals(S.P.D.T)
See Note 2

Shaft Type & Length

See Note 1

Resistance Taper

A: Audio (15A)
B: Linear (1B)
C: Reverse Audio(15C)
D: Audio(10A)

Total Resistance

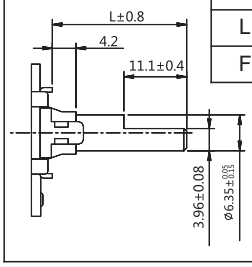
1K	2K
5K	10K
20K	50K
100K	200K
500K	1MEG

Operation Life

(Blank): Std Life w/o Anti-sulfur
1: Std Life w/ Anti-sulfur

Note 1: Shaft Type and Lengths

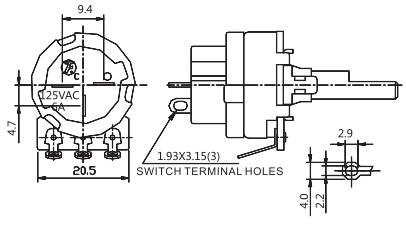
F-Type



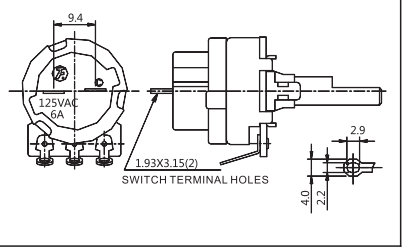
Code	1	2	3
L	18.4	23.8	25.9
F	8	11.1	11.1

Note 2: Switch Terminal Configuration

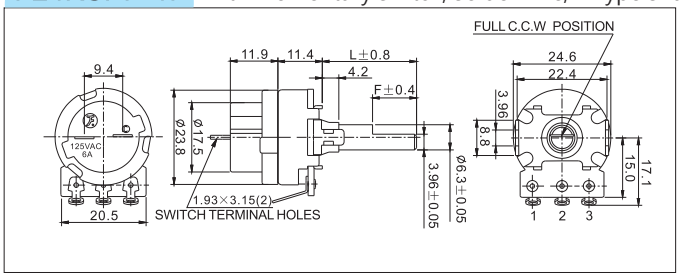
2 Switch Terminals

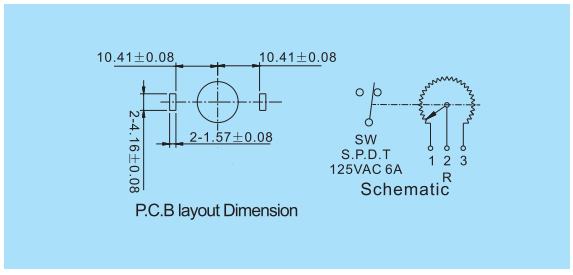


3 Switch Terminals

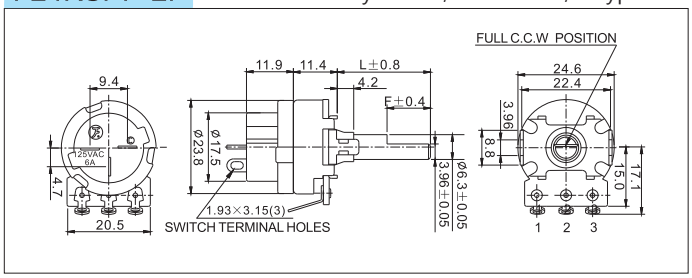


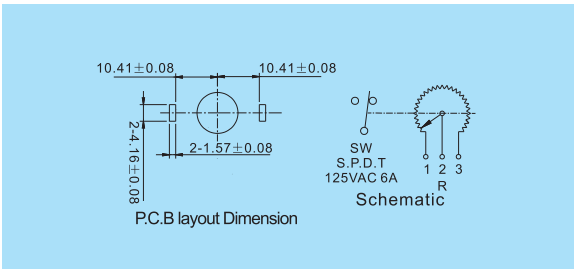
F24KSPP-1F With Momentary Switch, Solder Pins, F-Type Shaft, 2 Switch Terminals



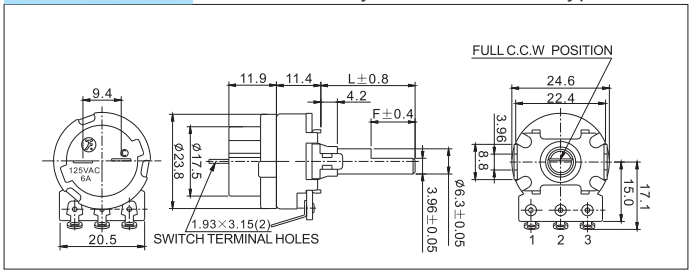


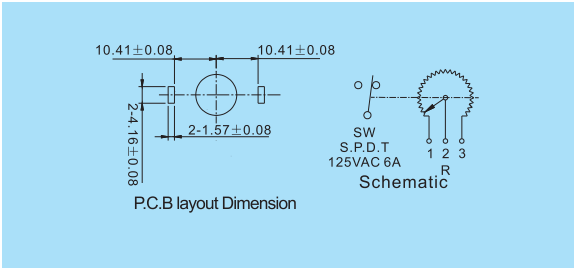
F24KSPP-2F With Momentary Switch, Solder Pins, F-Type Shaft, 3 Switch Terminals



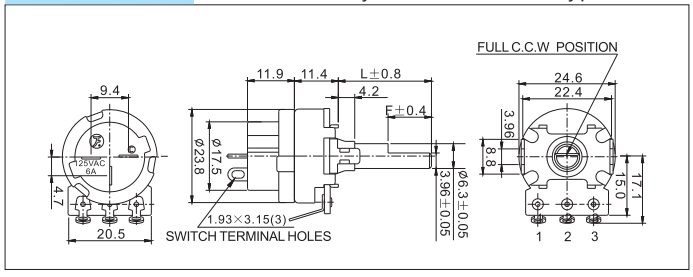


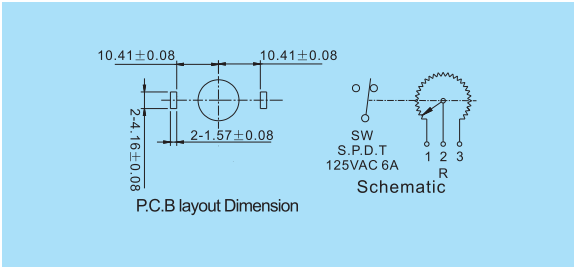
F24KSPP-1F With Momentary Switch, PC Pins, F-Type Shaft, 2 Switch Terminals



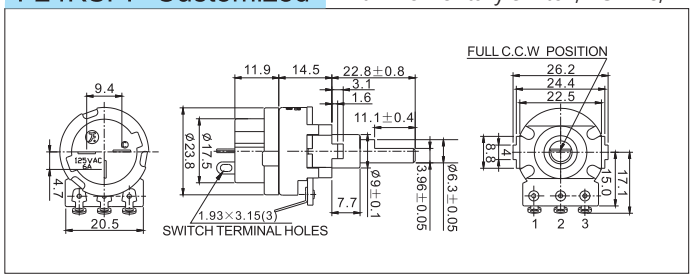


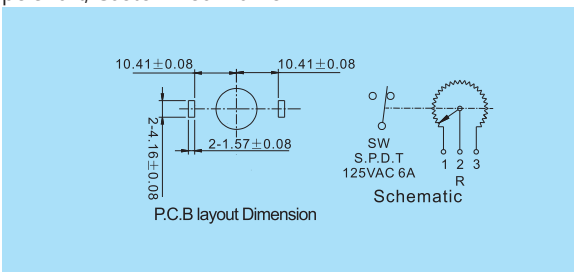
F24KSPP-2F With Momentary Switch, PC Pins, F-Type Shaft, 3 Switch Terminals





F24KSPP-Customized With Momentary Switch, PC Pins, F-Type Shaft, Customized Frame





F24K5 Series

Metal Shaft Potentiometer

Feature

1. 1 millions min cycles rotational life
2. Single-turn industrial panel controls
3. Long life type available.

F24K5 Series Rotary Potentiometer.

Application:

- Lamps
- Medical equipment
- Electric Accelerator
- Electrical Appliances

Electrical Characteristics

Total Resistance	1KΩ~1MΩ
Total Resistance Tolerance	500Ω<R<1MΩ: ±20%; R≤500Ω or R≥1MΩ: ±30%
Resistance Taper	A, B, C
Max. Operating Voltage	DC 200V
Rated Power	Linear Taper B: 0.5W; Other Tapers : 0.25W
Rotational Noise	300mV Max.
Insulation Resistance	More than 100MΩ at DC 1000V
Withstand Voltage	1 minute at AC 1000V
Residual Resistance	Term.1~2: Max. 0.5% of Total Resistance Term.2~3: Max. 0.5% of Total Resistance
Contact Noise	10% or less of Total Resistance

Mechanical Characteristics

Total Rotational Angle	300° ±10°
Rotational Torgue	0.5~7mN·m
Stopper Strength	918mN·m Min.
Push-pull Strength	127.5N Min.
Bushing Nut Tighter Strength	1.5N·m Min.

Durability

Rotational Life	Standard Life: 1,000,000 cycles Long Life: 2,000,000 cycles
Operating Temperature Range	-10° C~+70° C

HOW TO ORDERD

F24K5-	D	F	1	C	B	100K	1

Model Series

Seal Type

S: Sealed
D: Dustproof

Shaft Type & Length

See Note 1

Full CCW Position

See Note 2

Resistance Taper

A: Audio (15A)
B: Linear (0B)
C: Reverse Audio(15C)
D: Audio(10A)

Total Resistance

1K	2K	5K
10K	20K	50K
100K	200K	
500K	1MEG	

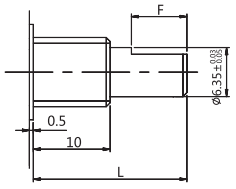
Operation Life

(Blank): Std Life w/o Anti-sulfur
7: Std Life w/ Anti-sulfur
8: Long Life w/ Anti-sulfur
9: Long Life w/o Anti-sulfur

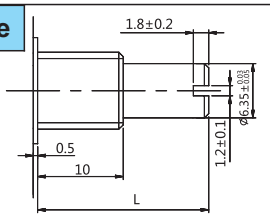
Note 1: Shaft Type and Lengths

F-Type

Code	L	F
1	20	7
2	20	8.5
3	30	12
4	35	12



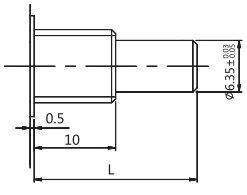
S-Type



Code	L
1	19
2	20
3	25
4	30
5	35
6	40
7	50

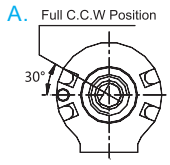
R-Type

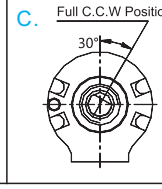
Code	L
1	19
2	20
3	22.2
4	30
5	35

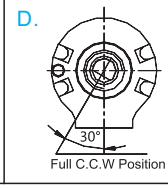


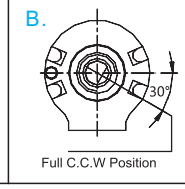
Note 2: Full C.CW Shaft Position:

F-Type Shaft

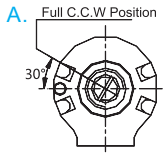


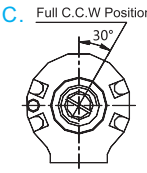




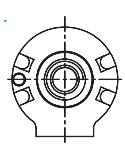


S-Type Shaft

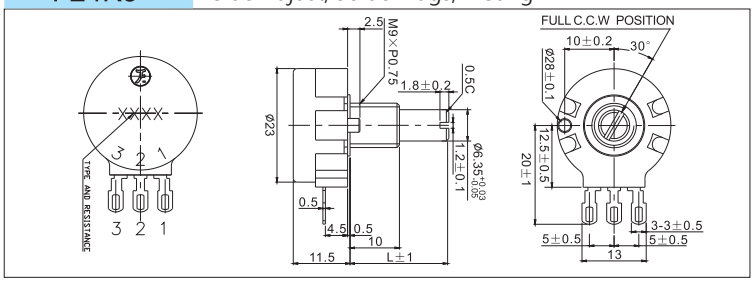


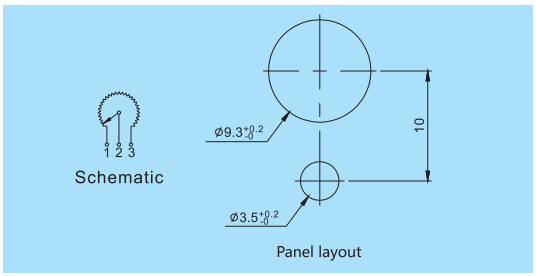


R-Type Shaft



F24K5 Side Adjust, Solder Lugs, 1 Gang





F09K Series Insulated Shaft Potentiometer

Feature

1. Flux builded-up preverntion is taken through inserting molding around the resistor with resin.
2. Carbon film element.
3. Insulated shaft.
4. Long life type available.

F09K Insulated Shaft Potentiometer.

Application:

- Gamepad
- Motor Mixer
- Sound Console
- Temperature Controller

Electrical Characteristics

Total Resistance	1KΩ~1MΩ
Total Resistance Tolerance	500Ω<R<1MΩ: ±20%; R≤500Ω or R≥1MΩ: ±30%
Resistance Taper	A, B, C
Max. Operating Voltage	AC 50V/DC 20V
Rated Power	Single Unit: 0.05W; Dual Unit: 0.03W
Rotational Noise	100mV Max.
Insulation Resistance	More than 100MΩ at DC250V
Withstand Voltage	1 minute at AC 250V
Residual Resistance	Term.1~2: Less than 20Ω Term.2~3: Less than 20Ω
Gang Error (Dual Unit)	-40dB~0dB±3dB

Mechanical Characteristics

Total Rotational Angle	280° ±10°
Rotational Torgue	1~9mN·m
Stopper Strength	300mN·m Min.
Push-pull Strength	50N Min.
Click Torgue	3~12mN·m

Durability

Rotational Life	Standard Life: 15,000 cycles Long Life: 100,000 cycles
Operating Temperature Range	-10° C~+85° C

HOW TO ORDERD

F09K-	N	H	0	1	F	1	C	B	100K	1

Model Series

Gang Number

N: Single Gang
G: Dual Gangs

Height: (See Note 2)

0: Not Available (for Top Adjust Type Only)
1: 6.5mm (for Side Adjust Type Only)
2: 10mm (for Side Adjust Type Only)
3: 12.5mm (for Side Adjust Type Only)

Shaft Type & Length

See Note 3

Full CCW Position

See Note 1

Operation Life

(Blank): Std Life w/o Anti-sulfur
1: Std Life w/Anti-sulfur
2: Long Life w/Anti-sulfur(Single Gang)
3: Long Life w/o Anti-sulfur(Single Gang)

Terminal & Bushing Configuration

H: Top Adjust, Bushingless
V: Side Adjust, Bushingless
A: Top Adjust, with Sleeve Bushing
B: Side Adjust, with Sleeve Bushing
See Note 4 (Bushing available only when shaft length longer than 20mm)

Detent Option

0: No Detent
1: Center Detent (For Single Gang Only)
2: 21 Detents (For Single Gang Only)

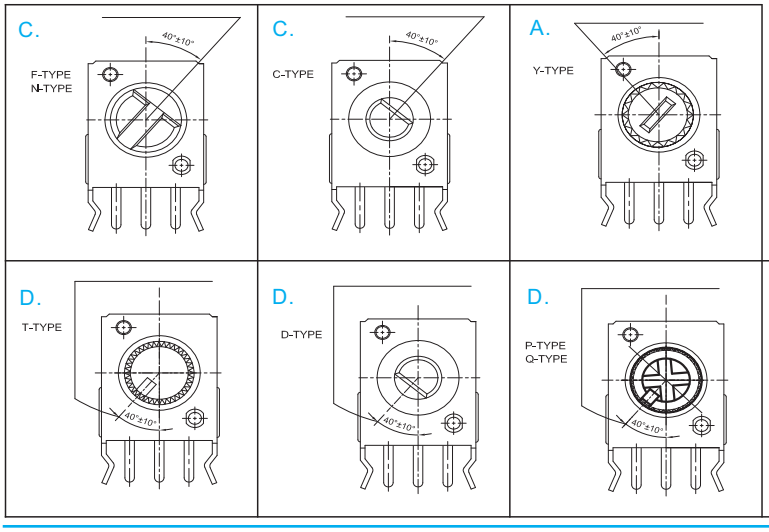
Resistance Taper

A: Audio (15A)
B: Linear, (1 Gang: 1B; 2Gangs: 3B)
C: Reverse Audio(15C)
D: Audio(10A)

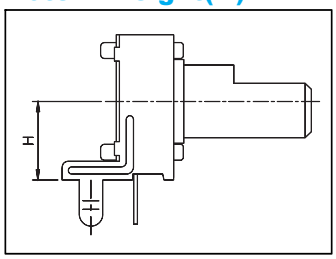
Total Resistance

1K	2K	5K	10K	20K
50K	100K	200K	500K	1MEG

Note 1: Full C.CW Shaft Position:

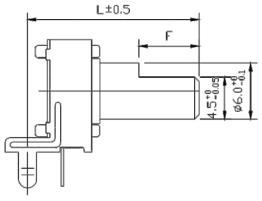


Note 2: Height(H)



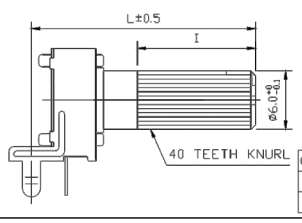
Note 3: Shaft Type and Lengths

F-TYPE



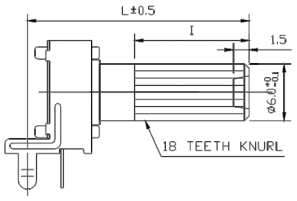
Code	1	2	3	4	5	6	7	8
L	15	18	20	25	25	30	34	35
F	6	9	7	7	12	12	11	12

P-TYPE



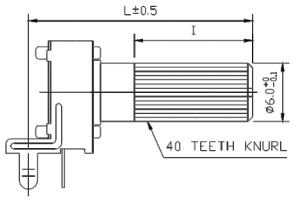
Code	1	2	3	4	5	6	7
L	9.5	15	15	20	25	30	35
I	0	6	7	7	7	7	7

Y-TYPE



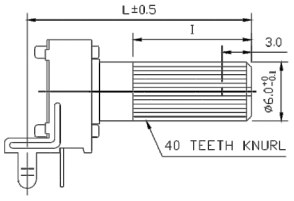
Code	1	2	3	4	5	6	7
L	15	16	20	25	30	35	15
I	7	7	7	7	7	7	6

Q-TYPE



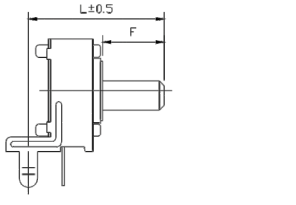
Code	1	2
L	15	20
I	7	7

T-TYPE



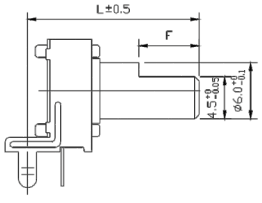
Code	1	2	3	4	5
L	15	20	25	30	35
I	6	7	7	7	7

C-TYPE



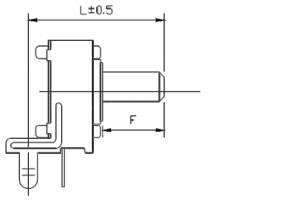
Code	1
L	12.5
F	4.5

N-TYPE



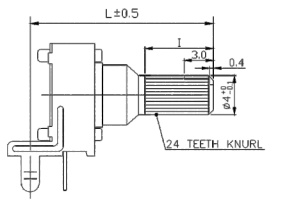
Code	1	2	3	4	5	6
L	15	20	25	30	34	35
F	6	7	12	12	12	12

D-TYPE



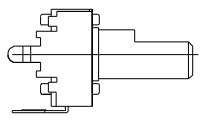
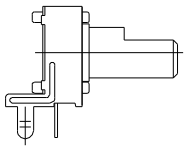
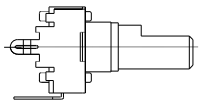
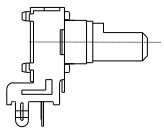
Code	1
L	12.5
F	4.5

K-TYPE

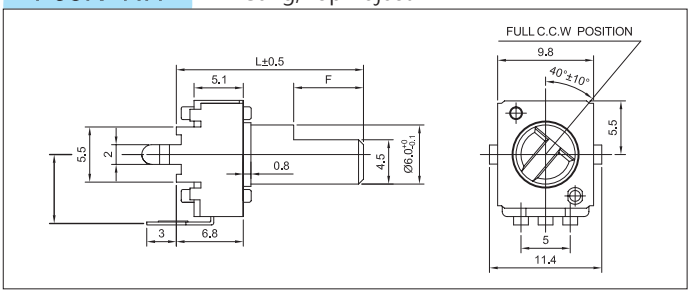


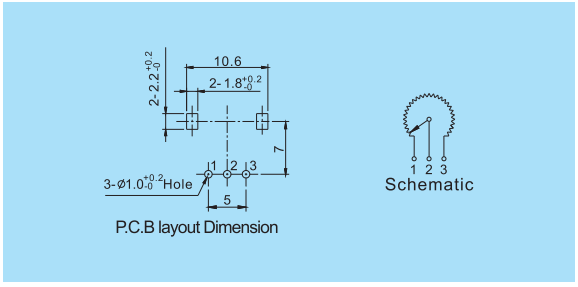
Code	1	2	3	4
L	20	25	30	35
I	7	7	7	7

Note 4: Terminal & Bushing Configuration

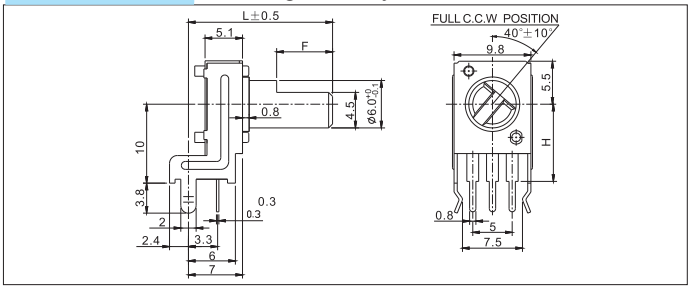
H-Type	V-Type	A-Type	B-Type
			
Bushingless	Bushingless	Sleeve Bushing	Sleeve Bushing

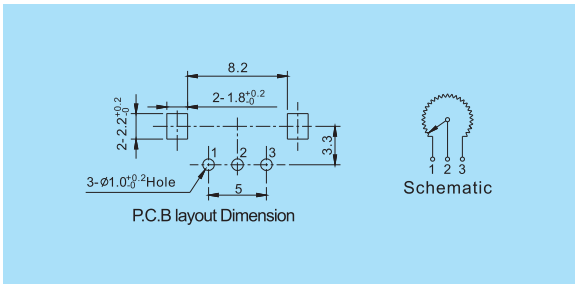
F09K- NH 1 Gang, Top Adjust



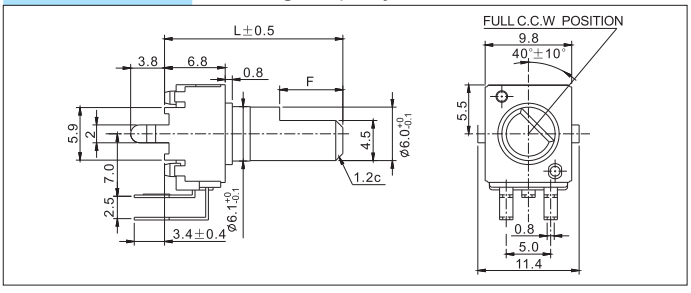


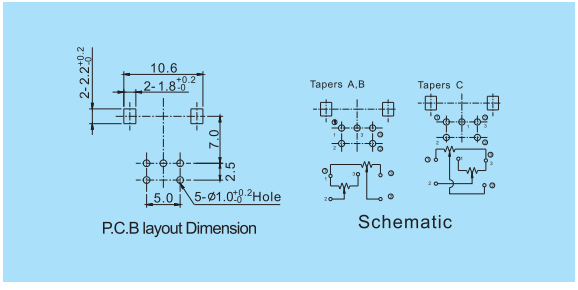
F09K- NV 1 Gang, Side Adjust



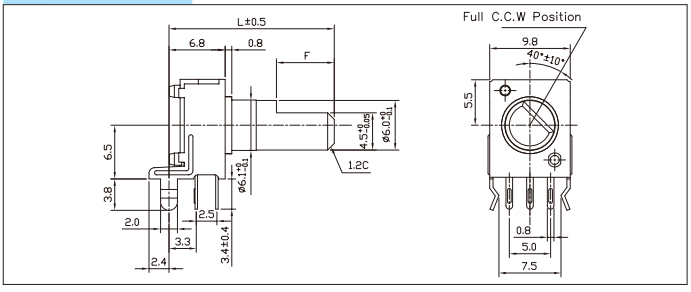


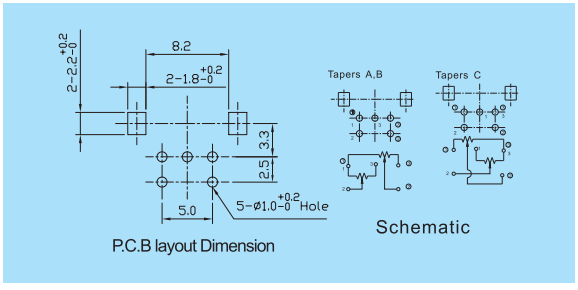
F09K- GH 2 Gangs, Top Adjust



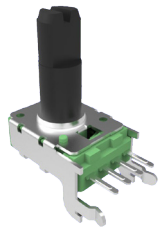


F09K- GV 2 Gangs, Side Adjust





F11K Series Insulated Shaft Potentiometer



Feature

1. Flux builded-up preverntion is taken through inserting molding around the resistor with resin.
2. Available with bushing, tap and detent.
3. Long life type available.

11mm Insulated Shaft Potentiometer.

Application:

- Gamepad
- Motor Mixer
- Sound Console
- Temperature Controller

Electrical Characteristics

Total Resistance	1KΩ~1MΩ
Total Resistance Tolerance	500Ω<R<1MΩ: ±20%; R≤500Ω or R≥1MΩ: ±30%
Resistance Taper	A, B, C
Max. Operating Voltage	Single Unit: AC 50V, DC 20V; Dual Unit: AC 30V
Rated Power	Single Unit: 0.05W; Dual Unit: 0.025W
Rotational Noise	100mV Max.
Insulation Resistance	Single Unit: ≥ 100MΩ at DC 500V Dual Unit: ≥ 100MΩ at DC 250V
Withstand Voltage	Single Unit: 1 minute at AC 500V Dual Unit: 1 minute at AC 300V
Residual Resistance	Term.1~2: ≤20Ω; Term.2~3: ≤20Ω
Gang Error (Dual Unit)	40dB~0dB±3dB

Mechanical Characteristics

Total Rotational Angle	300° ±10°
Rotational Torgue	2~10mN·m
Click Torgue	5~18mN·m
Stopper Strength	300mN·m Min.
Push-pull Strength	80N Min.

Durability

Rotational Life	Standard Life: 15,000 cycles Long Life: 100,000 cycles
Operating Temperature Range	-10° C~+70° C

HOW TO ORDERD

F11K-	G	H	0	1	0	F	1	C	B	100K	1

Model Series

Gang Number
- N: 1 Gang
- G: 2 Gangs

Terminal Configuration
- H: Top Adjust, PC Pins
- V: Side Adjust, PC Pins

Height: (See Note 2)
- 0: Not Available (for Top Adjust Type Only)
- 1: 10.0mm (for Side Adjust Type Only)
- 2: 12.5mm (for Side Adjust Type Only)

Bushing Option
- 0: without Bushing
- 1: with Bushing

Detent Option
- 0: No Detent
- 1: Center Detent
- 2: 11 Detents
- 3: 21 Detents

Shaft Type & Length
- See Note 3

Full CCW Position
- See Note 1

Resistance Taper
- A: Audio (15A)
- B: Linear, (Single Unit: 1B; Dual Gangs: 3B)
- C: Reverse Audio(15C)
- D: Audio(10A)

Total Resistance

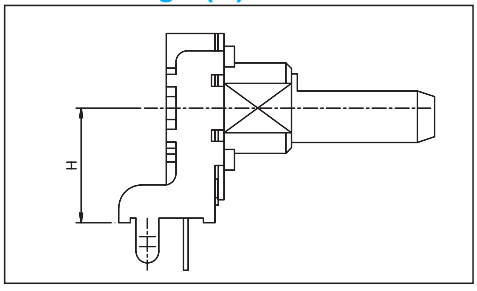
1K	2K	5K	10K	20K
50K	100K	200K	500K	1MEG

Operation Life
- (Blank): Std Life w/o Anti-sulfur
- 1: Std Life w/Anti-sulfur
- 2: Long Life w/Anti-sulfur
- 3: Long Life w/o Anti-sulfur

Note 1: Full C.CW Shaft Position:

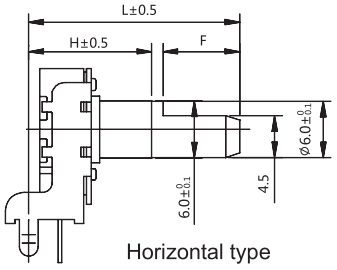
F-Type Shaft		Y-Type Shaft
C. Full C.C.W Position 30°±10°	D. Full C.C.W Position 30°±10°	A. Full C.C.W Position 30°±10°

Note 2: Height(H)



Note 3: Shaft Type and Lengths

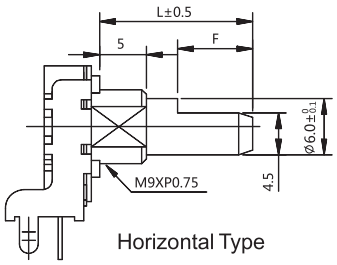
F-Type



without Bushing

Horizontal type

Code	1	2	3	4	5	6	7	8	9	0
L	15	18	20	22.5	24.5	25	27.5	30	32.5	36.2
F	4.5	7	7	7	11.5	12	12	12	12	12
H	10.5	10.5	13	13	13	13	13	13	13	13

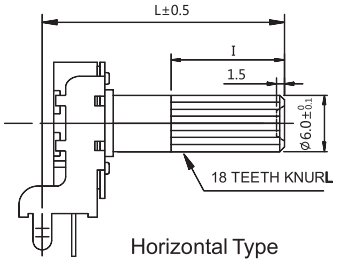


with Bushing

Horizontal Type

Code	1	2	3	4	5	6	7
L	12.5	15	17.5	20	22.5	25	28.7
F	7	7	12	12	12	12	12

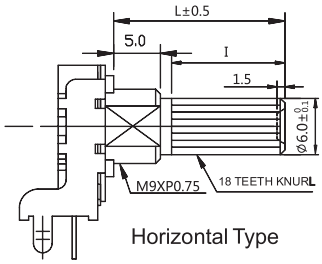
Y-Type



without Bushing

Horizontal Type

Code	1	2	3	4	5	6	7	8
L	15	20	22.5	24.7	27.5	29.7	32.5	35
I	5	7	7	12	12	12	12	12

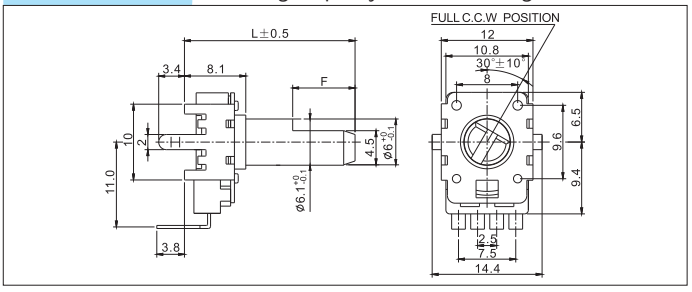


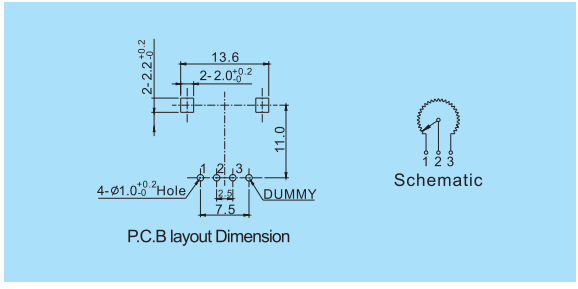
with Bushing

Horizontal Type

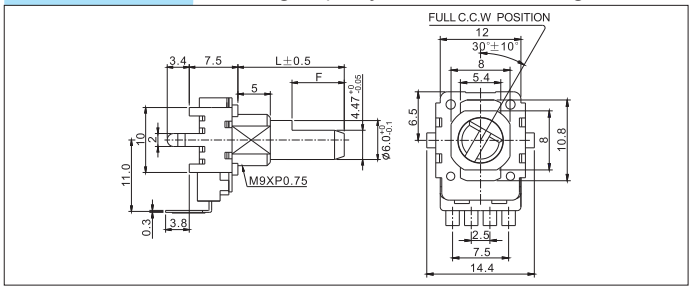
Code	1	2	3	4	5	6	7
L	12.5	15	17.2	20	22.2	25	27.5
I	7	7	12	12	12	12	12

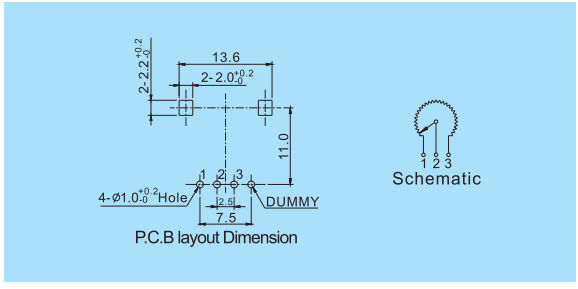
F11K-NH00 1 Gang, Top Adjust, No Bushing





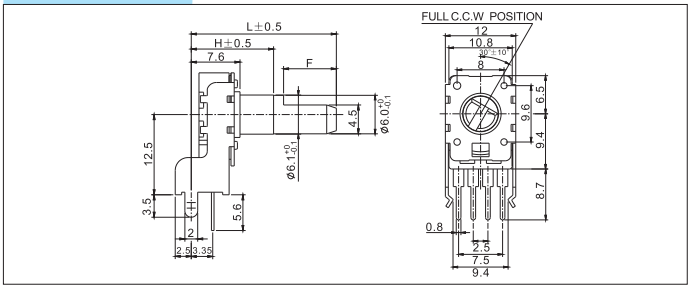
F11K-NH01 1 Gang, Top Adjust, with M9 Bushing

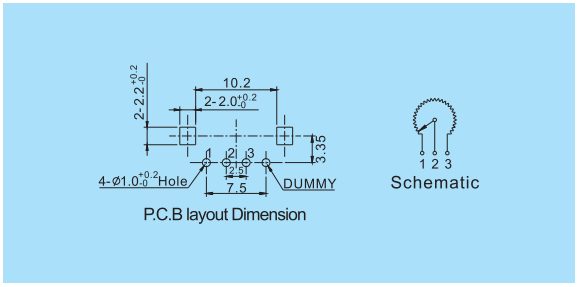




F11K-NV20

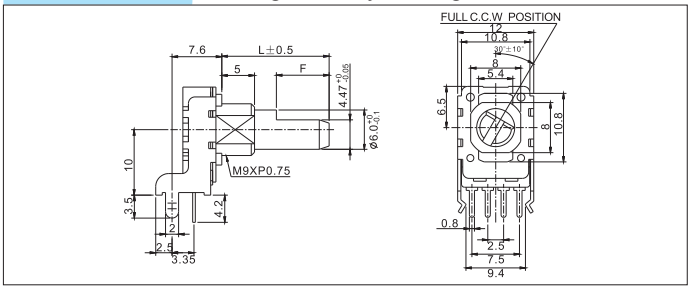
1 Gang, Side Adjust, Height 12.5mm, No Bushing

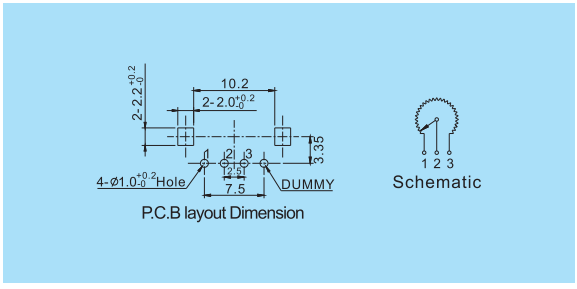




F11K-NV11

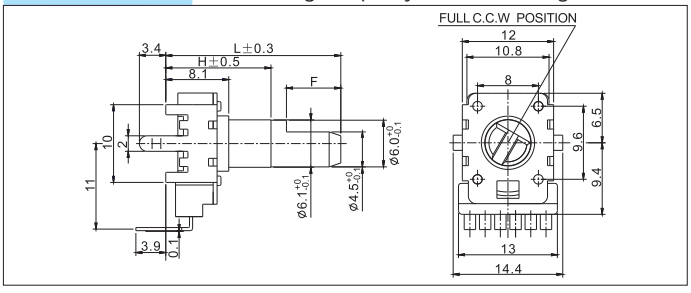
1 Gang, Side Adjust, Height 10mm, with M9 Bushing

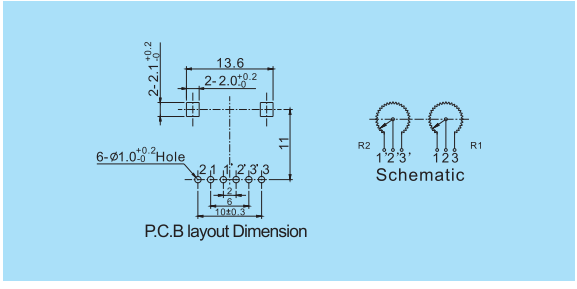




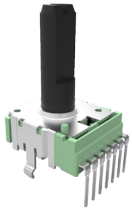
F11K-GH00

Dual Gangs, Top Adjust, No Bushing





F14K Series Insulated Shaft Potentiometer



Feature

1. Closed structure improves dust and flux resistance.
2. Available with bushing, tap and detent.
3. Long life type available.

F14K Series Rotary Potentiometer.

Application:

- Gamepad
- Motor Mixer
- Sound Console
- Temperature Controller

Electrical Characteristics

Total Resistance	1KΩ~1MΩ
Total Resistance Tolerance	500Ω<R<1MΩ: ±20%; R≤500Ω or R≥1MΩ: ±30%
Resistance Taper	A, B, C
Max. Operating Voltage	AC 50V
Rated Power	0.05W
Rotational Noise	100mV Max.
Insulation Resistance	≥ 100MΩ at DC 250V
Withstand Voltage	1 minute at AC 500V
Residual Resistance	Term.1~2: ≤20Ω; Term.2~3: ≤20Ω
Gang Error (Dual Unit)	-40dB~0dB±3dB

Mechanical Characteristics

Total Rotational Angle	300° ±10°
Rotational Torgue	3~13mN·m
Click Torgue	6~22mN·m
Stopper Strength	without Bushing:300mN·m Min. with Bushing:500mN·m Min.
Push-pull Strength	80N Min.

Durability

Rotational Life	Standard Life: 15,000 cycles Long Life: 100,000 cycles
Operating Temperature Range	-10° C~+70° C

HOW TO ORDERD

F14K-	H	0	1	0	F	1	C	B	10K	1

Model Series

Terminal Configuration

H: Top Adjust, PC Pins
V: Side Adjust, PC Pins

Height: (See Note 2)

0: Not Available (for Top Adjust Type Only)
1: 10.0mm (for Side Adjust Type Only)
2: 12.5mm (for Side Adjust Type Only)

Bushing Option

0: without Bushing
1: with Bushing

Detent Option

0: No Detent
1: Center Detent

Shaft Type & Length

See Note 3

Full CCW Position

See Note 1

Resistance Taper

A: Audio (15A)
B: Linear, (3B)
C: Reverse Audio(15C)
D: Audio(10A)

Total Resistance

1K	2K	5K	10K	20K
50K	100K	200K	500K	1MEG

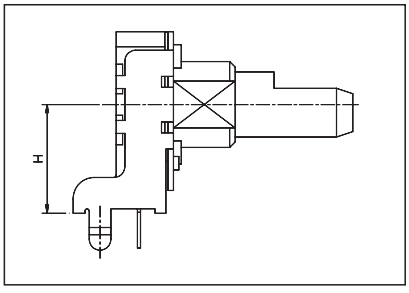
Operation Life

(Blank): Std Life w/o Anti-sulfur
1: Std Life w/Anti-sulfur
2: Long Life w/Anti-sulfur
3: Long Life w/o Anti-sulfur

Note 1: Full C.CW Shaft Position:

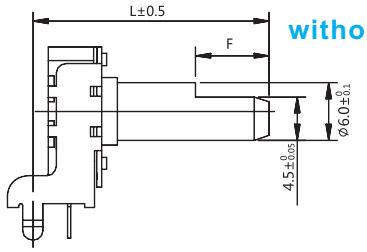
F-Type Shaft	Y-Type Shaft
C. Full C.C.W Position 30°±10°	A. Full C.C.W Position 30°±10°

Note 2: Height(H)



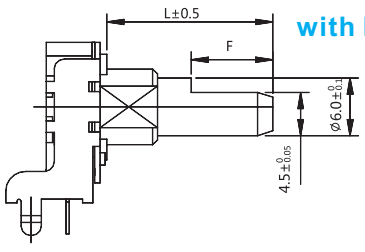
F-Type

without Bushing



Code	1	2	3	4	5	6	7	8	9
L	15	20	22.5	25	27.5	30	32.5	35	37.5
F	4.5	7	7	12	12	12	12	12	12

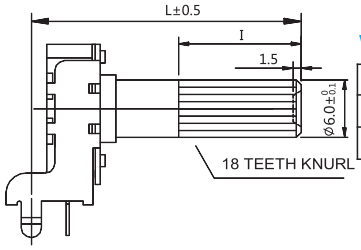
with Bushing



Code	1	2	3	4	5	6	7	8
L	12.5	15	17.5	20	22.5	25	27.5	30
F	7	7	12	12	12	12	12	12

Y-Type

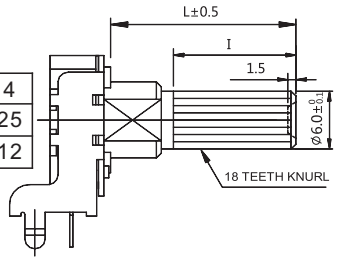
without Bushing



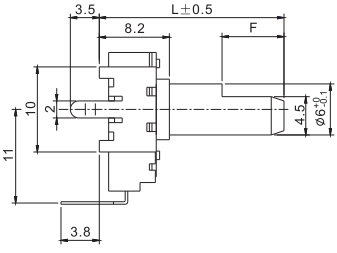
Code	1	2	3	4	5
L	15	20	22.5	27.5	32.5
I	5	7	7	12	12

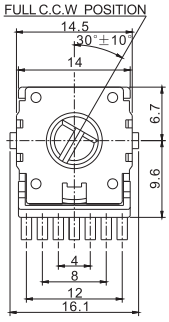
with Bushing

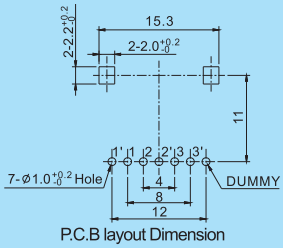
Code	1	2	3	4
L	12.5	15	20	25
I	7	7	12	12



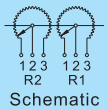
F14K-H00 Top Adjust, No Bushing





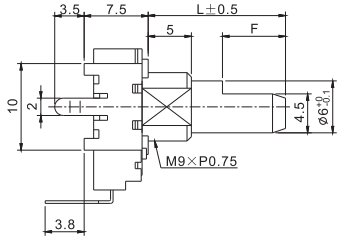


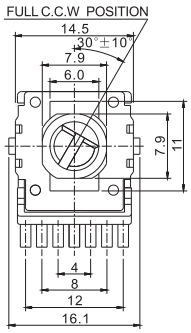
P.C.B layout Dimension

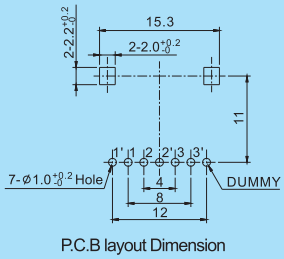


Schematic

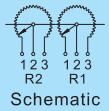
F14K-H01 Top Adjust, with M9 Bushing





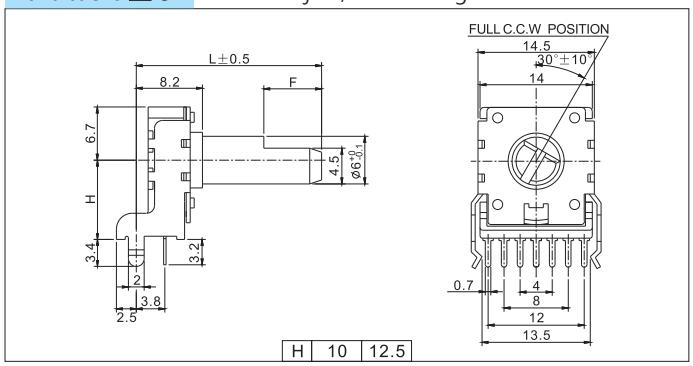


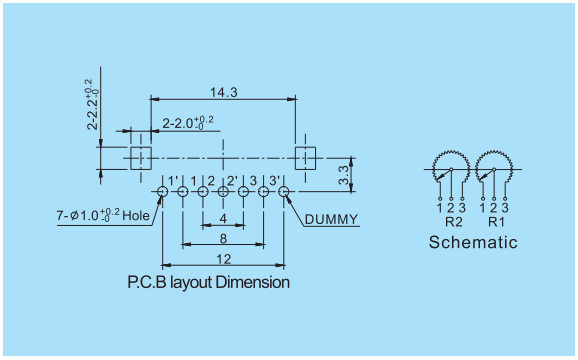
P.C.B layout Dimension



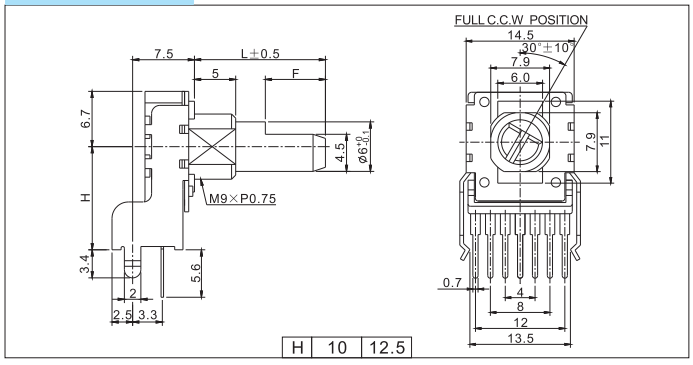
Schematic

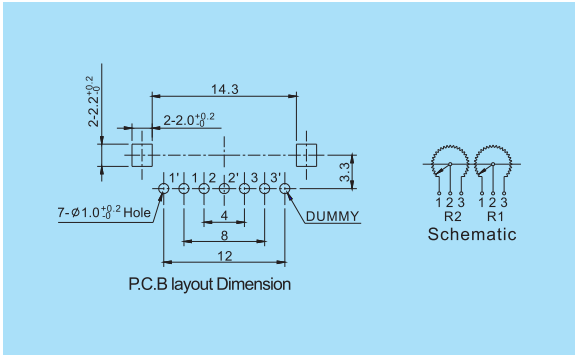
F14K-V□0 Side Adjust, No Bushing





F14K-V□1 Side Adjust, with M9 Bushing





F09R Series Insulated Shaft Potentiometer

Feature

1. Flux builded-up preverntion is taken through inserting molding around the resistor with resin.
2. Carbon film element.
3. Insulated shaft.
4. Long life type available.

F09R Insulated Shaft Potentiometer.

Application:

- Gamepad
- Sound Console
- Motor Mixer
- Temperature Controller

Electrical Characteristics

Total Resistance	1KΩ~1MΩ
Total Resistance Tolerance	500Ω<R<1MΩ: ±20%; R≤500Ω or R≥1MΩ: ±30%
Resistance Taper	A, B, C
Max. Operating Voltage	AC 50V/DC 20V;
Rated Power	Single Unit: 0.05W; Dual Unit: 0.03W
Rotational Noise	47mV Max.
Insulation Resistance	≥ 100MΩ at DC 250V
Withstand Voltage	1 minute at AC 250V
Residual Resistance	Term.1~2: ≤3Ω; Term.2~3: ≤3Ω
Gang Error (Dual Unit)	-40dB~0dB±3dB

Mechanical Characteristics

Total Rotational Angle	300° ±5°
Rotational Torgue	1~9mN·m
Stopper Strength	300mN·m Min.
Push-pull Strength	50N Min.
Click Torgue	3~12mN·m

Durability

Rotational Life	Standard Life: 30,000 cycles Long Life: 100,000 cycles
Operating Temperature Range	-10° C~+70° C

HOW TO ORDERD

F09R-	N	A	0	1	F	4	C	B	100K	1

Model Series

Gang Number
N: 1 Gang

Terminal & Bushing Configuration
A: Top Adjust, with Sleeve Bushing

Detent Option
0: No Detent
1: Center Detent

Height:
0: Not Available for Top Adjust Type

Shaft Type & Length
See Note 1

Full CCW Position
See Note 2

Resistance Taper
A: Audio (15A)
B: Linear, (1 Gang: 1B; 2 Gangs: 3B)
C: Reverse Audio(15C)
D: Audio(10A)

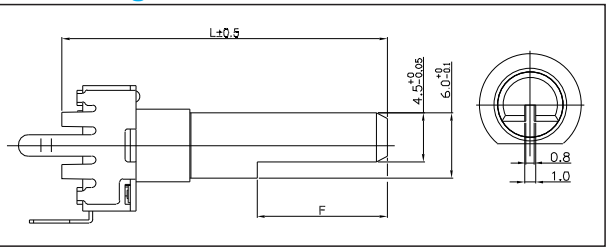
Operation Life
(Blank): Std Life w/o Anti-sulfur
1: Std Life w/Anti-sulfur
2: Long Life w/Anti-sulfur
3: Long Life w/o Anti-sulfur

Total Resistance	1K	2K	5K	10K	20K	50K	100K	200K	500K	1MEG

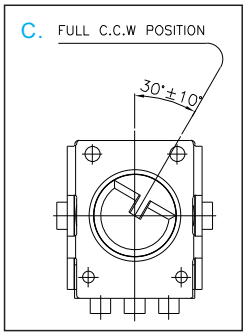
Note 1: Shaft Type and Lengths

F-Type

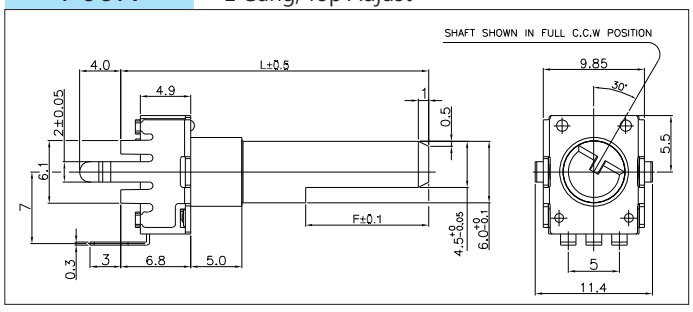
Code	2	3	4
L	20	25	30
F	7	12	12

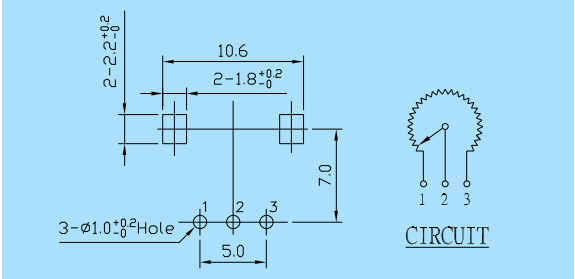


Note 2: Full C.CW Shaft Position:



F09R 1 Gang, Top Adjust





F11R Series Insulated Shaft Potentiometer

Feature

1. Flux builded-up preverntion is taken through inserting molding around the resistor with resin.
2. Available with bushing, tap and detent.
3. Long life type available.

11mm Insulated Shaft Potentiometer.

Application:

- Electronic instruments
- Sound Console
- TV

Electrical Characteristics

Total Resistance	1KΩ~1MΩ
Total Resistance Tolerance	500Ω<R<1MΩ: ±20%; R≤500Ω or R≥1MΩ: ±30%
Resistance Taper	A, B, C
Max. Operating Voltage	Single Unit: AC 50V, DC 20V; Dual Unit: AC 30V
Rated Power	Single Unit: 0.05W; Dual Unit: 0.025W
Rotational Noise	47mV Max.
Insulation Resistance	Single Unit: ≥ 100MΩ at DC 500V Dual Unit: ≥ 100MΩ at DC 250V
Withstand Voltage	Single Unit: 1 minute at AC 500V Dual Unit: 1 minute at AC 300V
Residual Resistance	Term.1~2: ≤3Ω; Term.2~3: ≤3Ω
Gang Error (Dual Unit)	40dB~0dB±3dB

Mechanical Characteristics

Total Rotational Angle	300° ±5°
Rotational Torgue	2~10mN·m
Click Torgue	5~18mN·m
Stopper Strength	300mN·m Min.
Push-pull Strength	80N Min.

Durability

Rotational Life	Standard Life: 15,000 cycles Long Life: 100,000 cycles
Operating Temperature Range	-10° C~+70° C

HOW TO ORDERD

F11R-	G	H	0	0	0	F	4	C	B	100K	1

Model Series

Gang Number
G: 2 Gangs

Terminal Configuration
H: Top Adjust, PC Pins

Height:
0: Not Available (for Top Adjust Type Only)

Bushing Option
0: without Bushing

Detent Option
0: No Detent
1: Center Detent

Shaft Type & Length
See Note 1

Full CCW Position
See Note 2

Resistance Taper
A: Audio (15A)
B: Linear, (1 Gang: 1B; 2 Gangs: 3B)
C: Reverse Audio(15C)
D: Audio(10A)

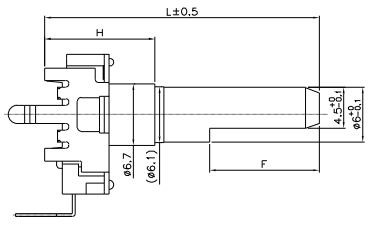
Operation Life
(Blank): Std Life w/o Anti-sulfur
1: Std Life w/Anti-sulfur
2: Long Life w/Anti-sulfur
3: Long Life w/o Anti-sulfur

Total Resistance	1K	2K	5K	10K	20K	50K	100K	200K	500K	1MEG

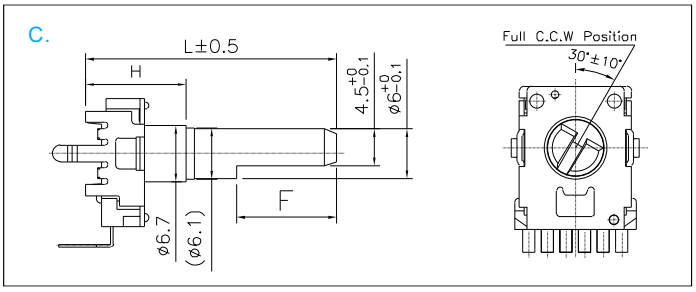
Note 1: Shaft Type and Lengths

F-Type

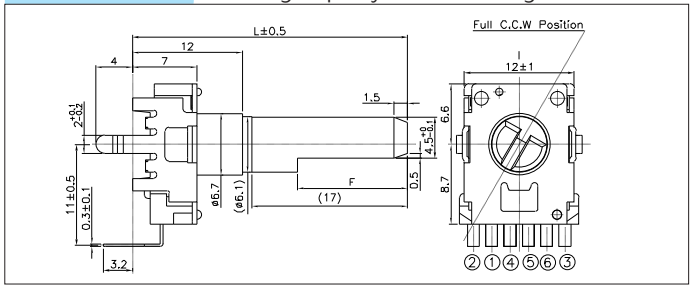
Code	4
L	30
F	12
H	12

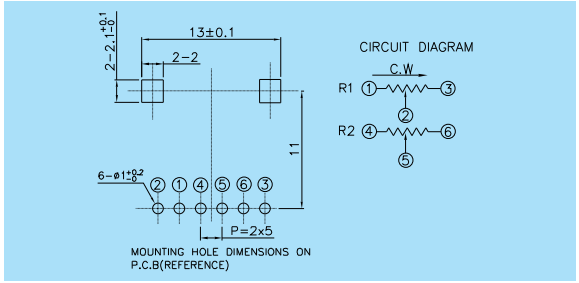


Note 2: Full C.CW Shaft Position:



F11R 1 Gang, Top Adjust, No Bushing





F1001 Series Thumbwheel Driving Potentiometer

Feature

1. Low-profile.
2. Dual-unit type offer superior gang error characteristics.
3. Dip and reflow solderable.

10mm thunbwheel driving Potentiometer.

Application:

- Volume Control
- headset
- Mini Stereo

Electrical Characteristics

Total Resistance	1KΩ~1MΩ
Total Resistance Tolerance	500Ω<R<1MΩ: ±20%; R≤500Ω or R≥1MΩ: ±30%
Resistance Taper	A, B, C
Rated Power	Linear Taper: 0.05W; Other Tapers: 0.025W
Rotational Noise	100mV Max.
Residual Resistance	Term.1~2: ≤20Ω; Term.2~3: ≤20Ω
Withstand Voltage	1 minute at AC 100V
Insulation Resistance	≥ 100MΩ at DC 100V
Gang Error (Dual Unit)	-40dB~0dB±3dB

Mechanical Characteristics

Total Rotational Angle	270° ±5°
Rotational Torgue	1~9mN·m
Stopper Strength	80mN·m Min.
Push-pull Strength	Push:5N Min. ; Pull:2N Min.

Durability

Rotational Life	10,000 cycles
Operating Temperature Range	-10° C~+70° C

HOW TO ORDERD

F1001-	N	N	1	B1	B	100K	1

Model Series

Gang Option

- N: Single Gang
- G: Dual Gangs
- T: Dual Gangs with Shared 3rd Terminal

Knob Dimension

See Note 1

Terminal Configuration (See Note 2)

- N: Horizontal Fixing, PC Pins
- P: Vertical Fixing, PC Pins

Knob Material & Color

- B1: Glossy Black
- B4: Dull Polish Black
- B7: Black(for SMD)

Resistance Taper

- A: Audio (15A)
- B: Linear, (Single Unit: 1B; Dual Gangs: 3B)
- C: Reverse Audio(15C)
- D: Audio(10A)

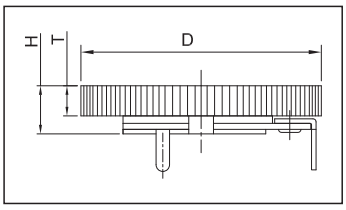
Total Resistance

1K	2K	5K	10K	20K
50K	100K	200K	500K	1MEG

Operation Life

- (Blank): Std Life w/o Anti-sulfur
- 1: Std Life w/Anti-sulfur
- 2: Long Life w/Anti-sulfur
- 3: Long Life w/o Anti-sulfur

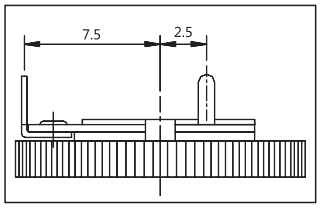
Note 1: Knob Dimension



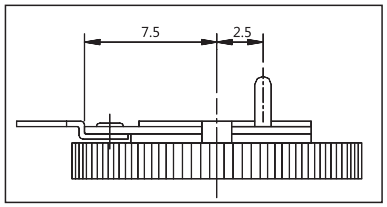
Code	1	2	3	4	5	6	7	8	9	0
D	14	14	14	16	16	16	18	18	20	20
T	1.0	2.0	2.8	2.0	2.65	2.8	2.0	2.8	2.0	2.8
H	2.4	3.4	4.2	3.4	4.1	4.2	3.4	4.2	3.4	4.2

Note 2: Terminal Configuration:

N: Top Adjust, PC Pins

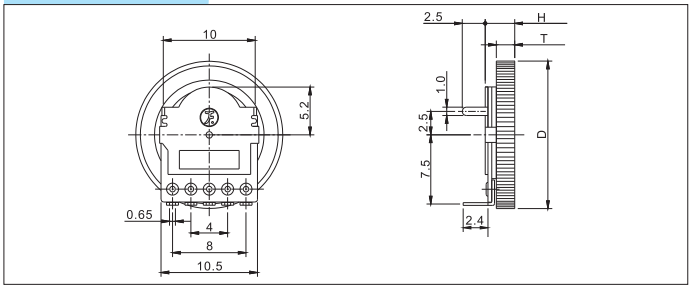


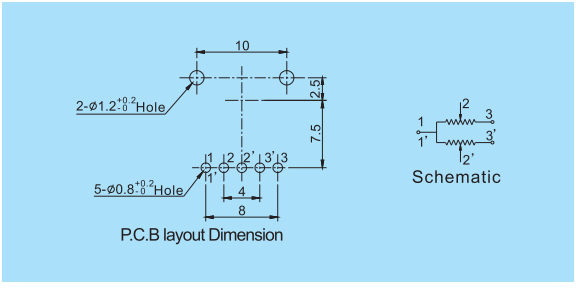
P: Side Adjust, PC Pins



F1001-GN

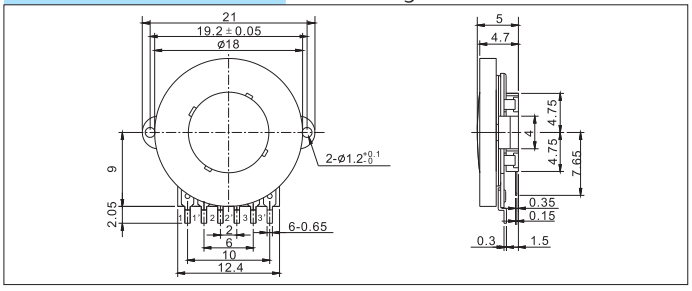
Dual Gangs, Top Adjust, PC Pins

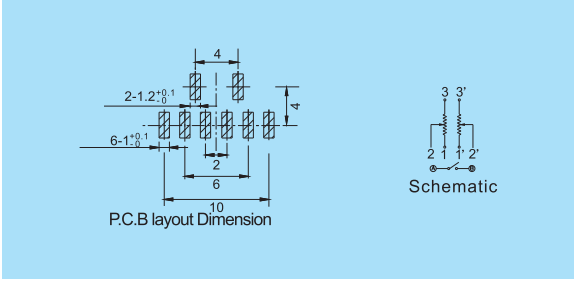




F1001-Customized

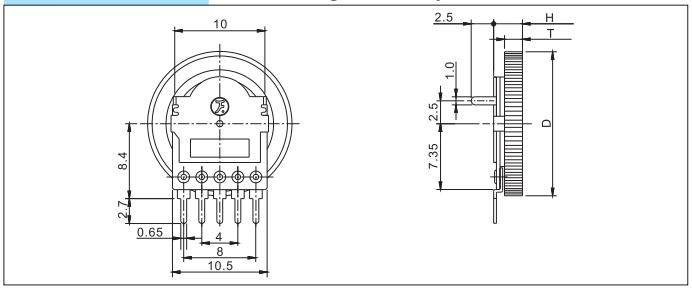
Dual Gangs, SMD Pins, with Customized Numbers Printed on Wheel

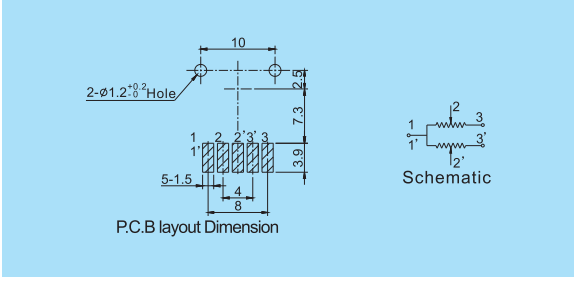




F1001-GP

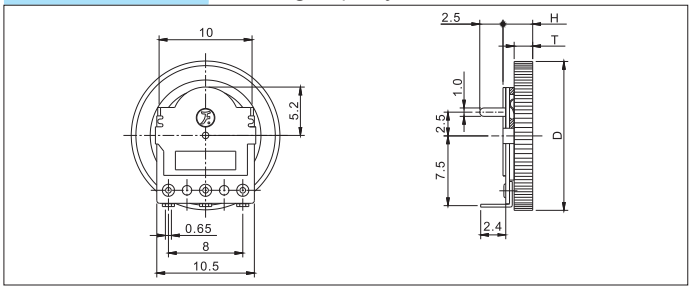
Dual Gangs, Side Adjust, PC Pins

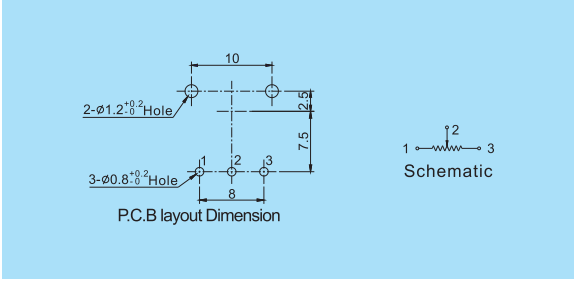




F1001-NN

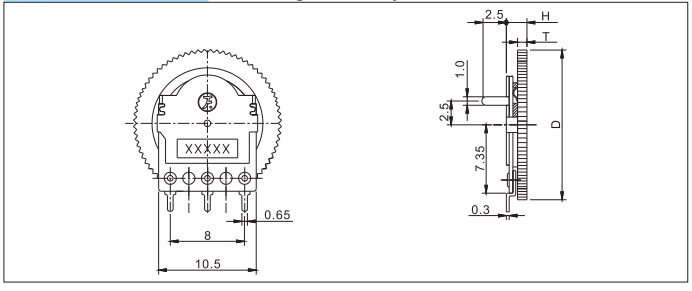
1 Gang, Top Adjust, PC Pins

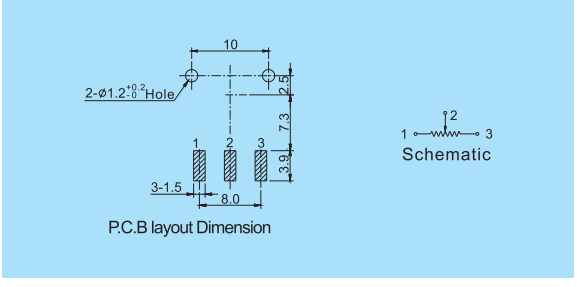




F1001-NP

1 Gang, Side Adjust, PC Pins





FJ08K Series Joystick Potentiometer

Feature

1. Superior operational feeling free from gaps in operating directions ideal for finger-tip operation.
2. Integrated tact switch for selection contributes to the improvement of user-friendliness of the set.
3. Long life type available.

FJ08K Series Joystick Potentiometer.

Application:

- Gamepad
- Model airplane
- Remote control products

Electrical Characteristics

Total Resistance	5KΩ~100KΩ
Total Resistance Tolerance	±20%
Resistance Taper	B Taper
Rated Power	Taper B: 0.0125W
Withstand Voltage	1 minute at AC 250V
Insulation Resistance	≥ 100MΩ at DC 250V
Contact Resistance	≤20% of the total resistance

Durability

Operating Life	1,000,000 cycles
Operating Temperature Range	-10° C~+70° C

Mechanical Characteristics

Figure of the Slide Bar Operating	Slide on the 2D Flat
Stopper Strength of Slide Bar	≥30N for 3sec Min.
Pull Strength of Slide Bar	≥30N for 3sec Min.
Push Strength of Slide Bar	≥30N for 3sec Min.
Travel of the Slide Bar	2mm
Operating Force of Slide Bar	1.2±0.5N

Switch Characteristics

Contact Resistance	Less than 300 mΩ
Travel	0.25+0.2/-0.1mm
Operating Force	4.8±1.5N
Switch Life	100,000 cycles
Operating Temperature Range	-10° C~+70° C

HOW TO ORDERD

FJ08K	N	1	B	10K

Model Series

Switch Option

- N: No Switch
- P: with Tact Switch(Metal Shaft)

Carbon Track Design

- 0: 4mm Carbon Film
- 1: 4mm Carbon Film with 0.4mm Silver Layer in the Middle
- 2: 4mm Carbon Film with 0.55mm Insulating Ink in the Middle

Resistance Taper

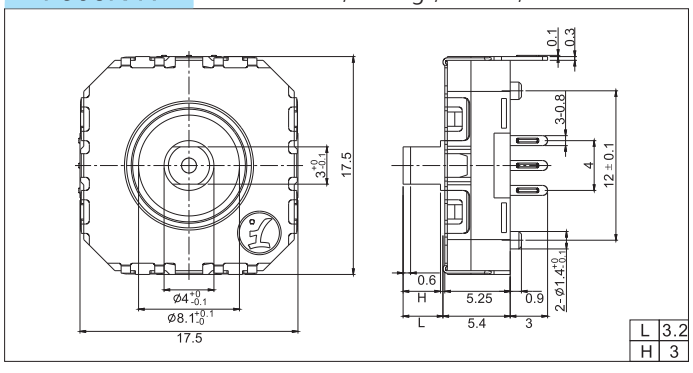
- B: Linear(0B)

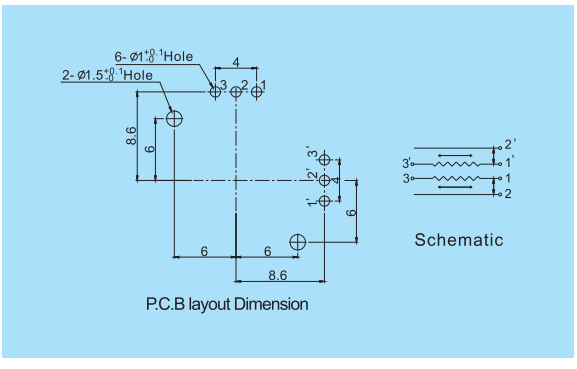
Total Resistance

1K	10K	20K	50K	100K

FJ08K-N

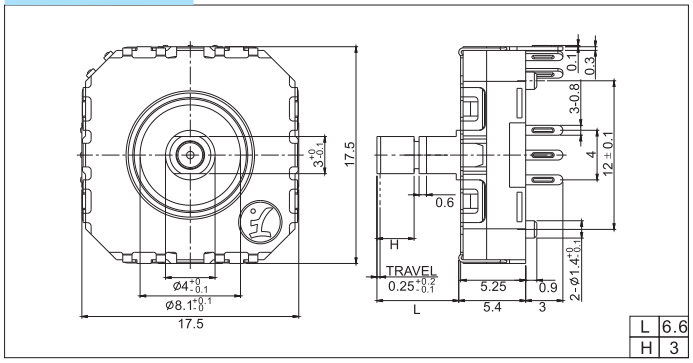
Plastic Shaft, 2 Gangs, PC Pins, No Switch



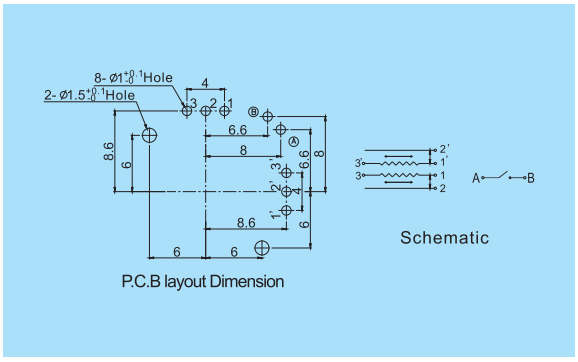


FJ08K-S

Metal Shaft, 2 Gangs, PC Pins, with Tact Switch

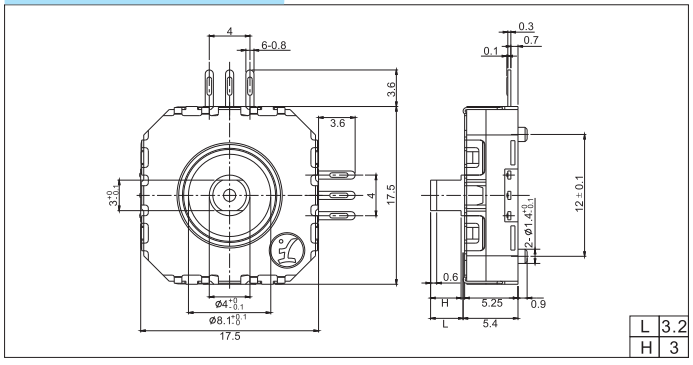


L	6.6
H	3

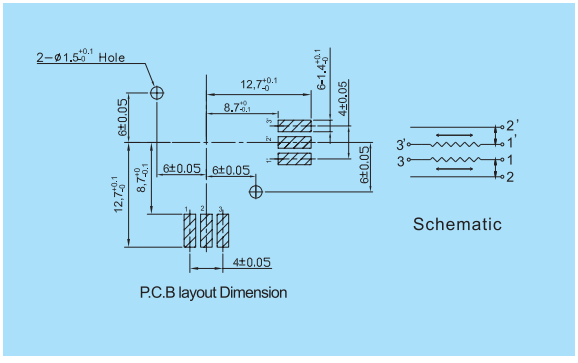


FJ08K-Customized

Plastic Shaft, 2 Gangs, Customized SMD Soldering Terminal, No Switch

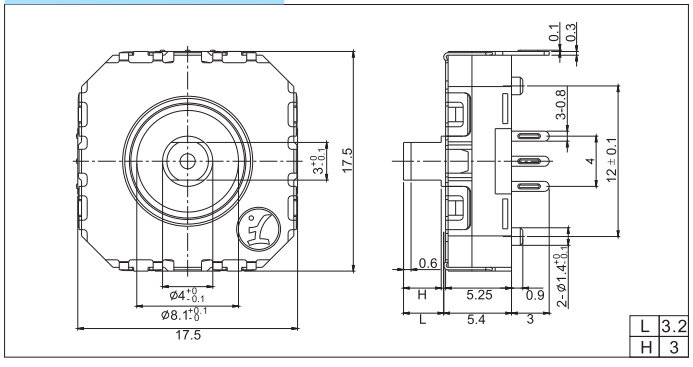


L	3.2
H	3

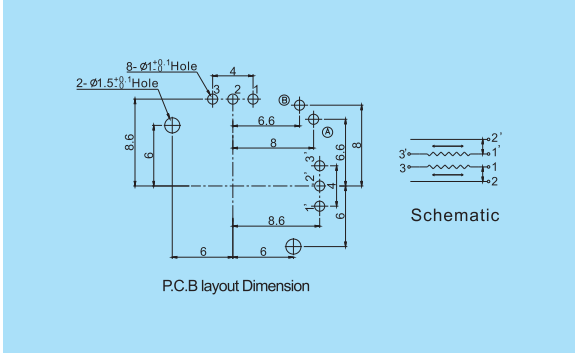


FJ08K-Customized

Plastic Shaft, 2 Gangs, PC Pins, No Switch, Shaft can be Rotated 360°



L	3.2
H	3



F10K Series Joystick Potentiometer

Feature

1. Carbon element.
2. Inserting molding around the resistor with resin.
3. Long life, Miniature structure.
4. Long life type available.

F10K Series Joystick Potentiometer.

Application:

- Gamepad
- Model Airplane
- Remote control products

Electrical Characteristics

Total Resistance	10KΩ~100KΩ
Total Resistance Tolerance	±20%
Resistance Taper	B Taper
Rated Power	0.0125W
Withstand Voltage	1 minute at AC 250V
Insulation Resistance	≥ 100MΩ at DC 250V 1minute
Max. Operating Voltage	AC50V, DC5V

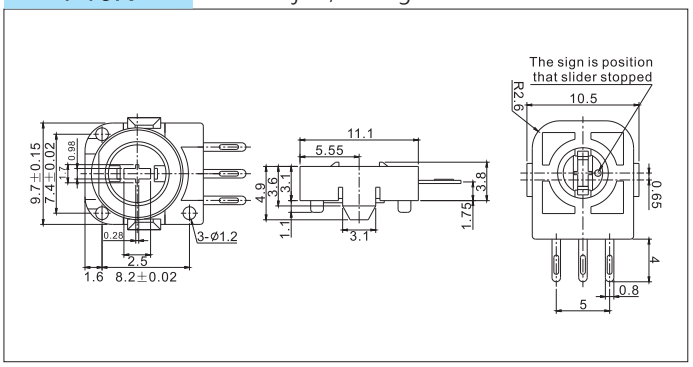
Mechanical Characteristics

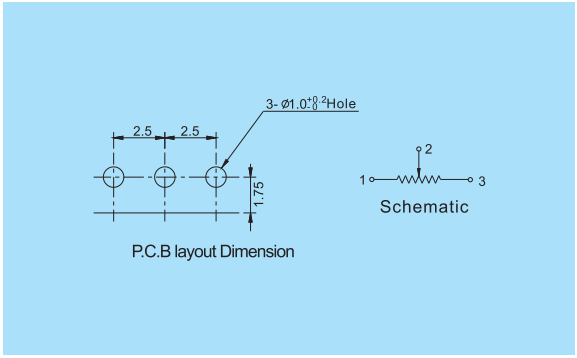
Total Rotation Angle	360°
Rotational Torque	Less than 500mN
Push Strength of Shaft	20N Min.

Durability

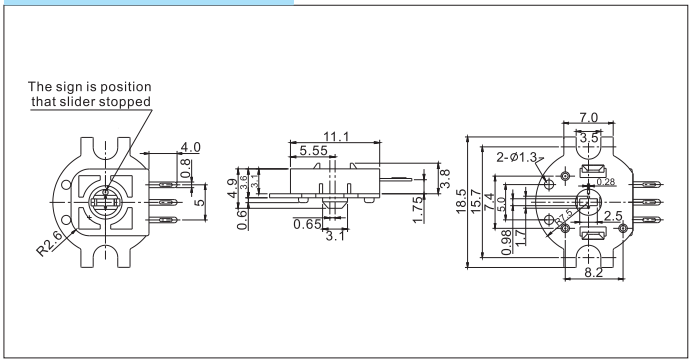
Operating Life	Standard life: 1,000,000 cycles Long life: 2,000,000 cycles
Operating Temperature Range	-10° C~+70° C

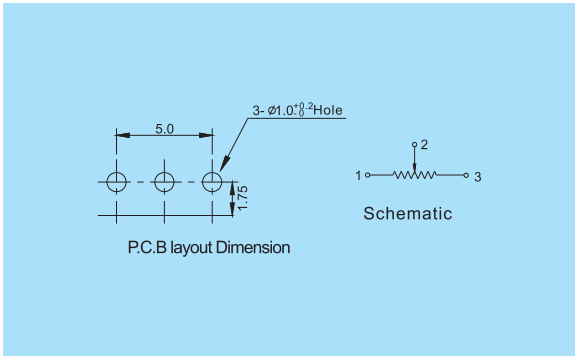
F10K Side Adjust, 1 Gang





F10K-Customized Side Adjust, 1 Gang, Customized Frame





HOW TO ORDERD

F10K	B	10K	D0	8

Model Series: F10K

Resistance Taper: B: Linear(0B)

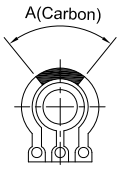
Total Resistance: 5K | 10K | 20K | 50K | 100K

Electric Effective Angle: See Note 1

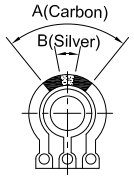
Operation Life: (Blank): Std Life; 8: Long Life

Note1: Electric Effective Angle

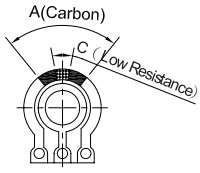
ANGLE A	Code	ANGLE A	Code	ANGLE A	Code	ANGLE A	Code
15°	e5	45°	B5	85°	F5	200°	R0
20°	d0	50°	C0	90°	G0	210°	S0
25°	d5	53°	C3	95°	G5	220°	T0
28°	d8	55°	C5	120°	J0	250°	W0
30°	A0	60°	D0	147°	L7	265°	X5
32°	A2	65°	D5	150°	M0	270°	Y0
35°	A5	70°	E0	160°	N0	300°	b0
38°	A8	78°	E8	170°	O0	330°	h0
40°	B0	80°	F0	180°	P0		



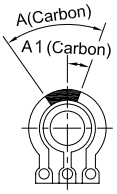
ANGLE A	B	Code	ANGLE A	B	Code	ANGLE A	B	Code	ANGLE A	B	Code
60°	6°	01	30°	6°	11	40°	6°	20	45°	8°	48
38°	6°	03	50°	8°	12	25°	12°	22	32°	8°	51
38°	8°	04	85°	8°	13	35°	6°	26	20°	6°	52
50°	6°	05	100°	8°	14	40°	3°	30	45°	10°	55
53°	6°	06	80°	10°	15	147°	3°	32	$48°^{+0}_{-3°}$	6°	56
45°	3°	07	60°	10°	16	70°	6°	33	45°	6°	73
32°	3°	08	25°	6°	17	28°	6°	34	46°	8°	74
53°	8°	09	50°	3°	18	35°	8°	35			
45°	5°	10	45°	15°	19	42°	8°	44			



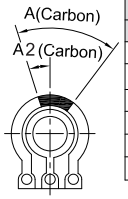
ANGLE A	C	Code	ANGLE A	C	Code	ANGLE A	C	Code	ANGLE A	C	Code
45°	12°	25	35°	8°	38	45°	10°	54	53°	12°	64
38°	8°	27	50°	6°	42	35°	5°	60			
45°	5°	28	40°	6°	43	54°	6°	59			
60°	5°	29	53°	10°	47	60°	10°	66			
40°	12°	31	30°	8°	53	32°	6°	71			



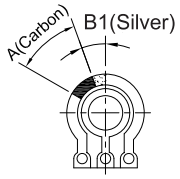
ANGLE A	A1	Code
20°	3°	23
25°	6°	36



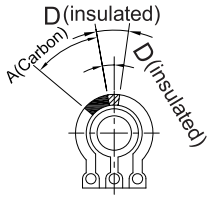
ANGLE A	A2	Code
120°	40°	02
20°	0°	21
20°	3°	24
25°	6°	37
45°	5°	61



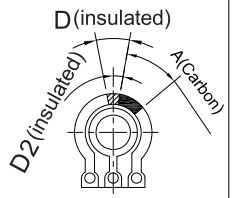
ANGLE A	B1	Code
20°	3°	40
17°	3°	45
30°	0°	49
23^{+0}_{-3}°	0°	65
36°	68°	68
17°	7°±2°	69



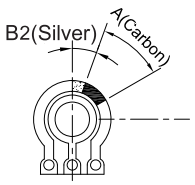
ANGLE A	D	D1	Code
40°	$16^{+2°}_{±0}$	$8°^{+2°}_{±0}$	57
32°	$24^{+2°}_{±0}$	$16^{+2°}_{±0}$	62



ANGLE A	D	D2	Code
40°	$16^{+2°}_{±0}$	$8°^{+2°}_{±0}$	58
32°	$24^{+2°}_{±0}$	$16^{+2°}_{±0}$	63



ANGLE A	B2	Code
20°	3°	41
17°	3°	46
30°	0	50
17°	7°±2°	70



碳膜层 (Carbon) 硫化层 (Anti-Sulfurated) 银层 (Silver) 绝缘层 (insulated) 低碳层 (Low Resistance)

F10KV Series Joystick Potentiometer

Feature

1. Carbon element.
2. Inserting molding around the resistor with resin.
3. Long life, Miniature structure.
4. Long life type available.

F10KV Series Joystick Potentiometer.

Application:

- Gamepad
- Model Airplane
- CD Player

Electrical Characteristics

Total Resistance	1KΩ~1MΩ
Total Resistance Tolerance	500Ω<R<1MΩ: ±20%; R≤500Ω or R≥1MΩ: ±30%
Resistance Taper	B Taper
Rated Power	Taper B: 0.0125W
Withstand Voltage	1 minute at AC 250V
Insulation Resistance	≥ 100MΩ at DC 250V 1minute
Max. Operating Voltage	AC 50V, DC 5V
Residual Resistance	Term.1~2: ≤5% of Total **Resistance** ; Term.2~3: ≤5% of Total **Resistance**
Rotational Noise	≤300mV

Mechanical Characteristics

Total Rotation Angle	300° ±10°
Rotational Torque	0.3~5mN·m
Rotational Stopper Strength	200mN·m Min.
Push-pull Strength	Push: 50N Min. Pull: 50N Min.

Durability

Rotational Life	Standard life: 100,000 cycles Long life: 1,000,000 cycles
Operating Temperature Range	-10° C~+70° C

HOW TO ORDERD

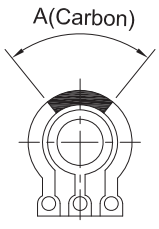
F10KV	F	1	D	B	10K	D0	1

- **Model Series**: F10KV
- **Shaft Type & Length**: See Note 2
- **Full CCW Position**: See Note 3
- **Resistance Taper**: B: Linear(0B)
- **Total Resistance**: 1K, 2K, 5K, 10K, 20K, 50K, 100K, 200K, 500K, 1MEG
- **Electric Effective Angle**: See Note 1
- **Operation Life**:
  - (Blank): Std Life w/o Anti-sulfur
  - 1: Std Life w/Anti-sulfur
  - 6: Long Life w/Anti-sulfur
  - 7: Long Life w/o Anti-sulfur

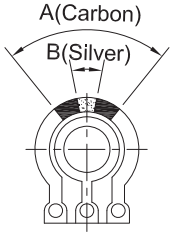
Note1: Electric Effective Angle

F10KV

ANGLE A	Code	ANGLE A	Code
18°	e8	90°	G0
27°	d7	110°	I0
37°	A7	180°	P0
40°	B0	220°	T0
50°	C0	235°	U5
87°	F7		



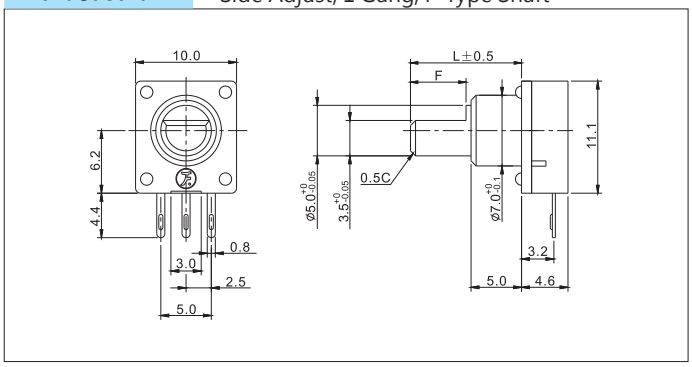
ANGLE A	ANGLE B	Code
33.5°	0°	01
212.5°	0°	02
53°	6°	03
45°	6°	04
60°	3°	05
50°	16°	12
30°	6°	14
26°	6°	15

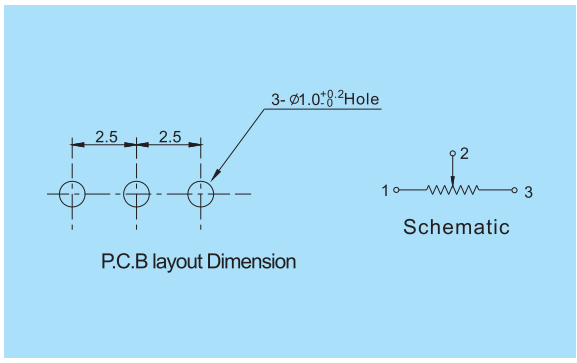


碳膜层 (Carbon)　硫化层 (Anti-Sulfurated)　银层 (Silver)

F10KV-F

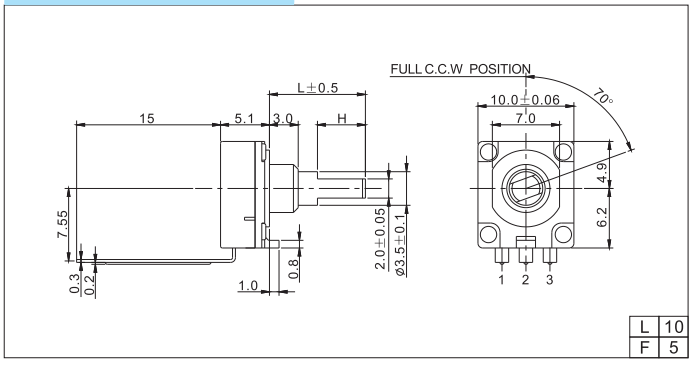
Side Adjust, 1 Gang, F-Type Shaft

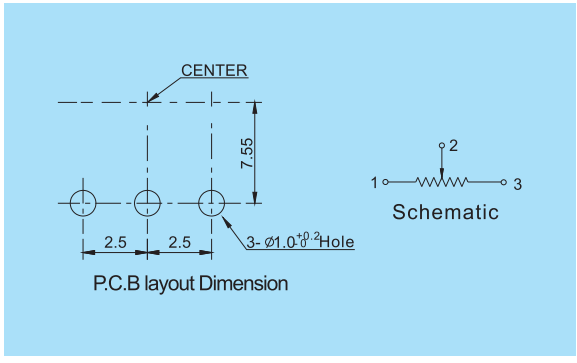




F10KV-Customized

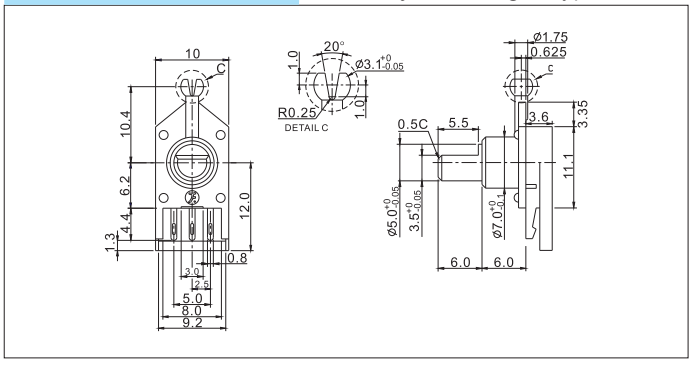
Top Adjust, 1 Gang, H-Type Shaft, Customized Terminal

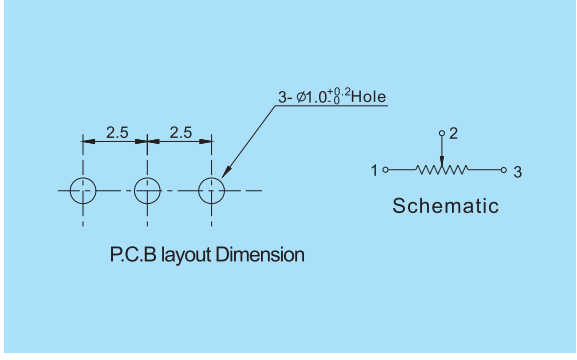




F10KV-Customized

Side Adjust, 1 Gang, F-Type Shaft, Customized Structure





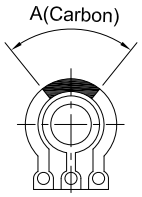
HOW TO ORDERD

FM10K-	B	10K	D0	8
Model Series	Resistance Taper	Total Resistance	Electric Effective Angle	Operation Life
	B: Linear(0B)	5K 10K 20K 50K 100K	See Note 1	(Blank): Std Life 8: Long Life

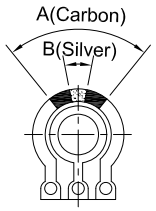
Note1: Electric Effective Angle

FM10K

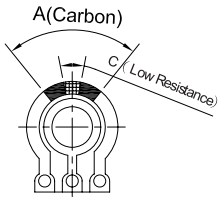
ANGLE A	Code	ANGLE A	Code
30°	A0	270°	Y0
32°	A2		
35°	A5		
38°	A8		
40°	B0		
45°	B5		
50°	C0		
60°	D0		
90°	G0		



ANGLE A	ANGLE B	Code	ANGLE A	ANGLE B	Code
45°	3°	01	32°	4°	14
50°	6°	02	38°	8°	15
40°	6°	03	76°	8°	16
60°	6°	04	45°	8°	18
45°	6°	05	25°	6°	21
38°	6°	06			
35°	6°	07			
32°	6°	08			
30°	6°	09			



ANGLE A	ANGLE C	Code	ANGLE A	ANGLE C	Code
45°	6°	11			
38°	9°	12			
45°	9°	13			



碳膜层 (Carbon) 硫化层 (Anti-Sulfurated) 银层 (Silver) 低碳层 (Low Resistance)

FJM10K Series Joystick Potentiometer

Feature

1. Superior operational feeling free from gaps in operating diections ideal for finger-tip operation.
2. Integrated tact switch for selection contributes to the improvement of user-friendliness of the set.
3. Long life type available.

FJM10K Series Joystick Potentiometer.

Application:

- Gamepad
- Model Airplane
- Remote control products

Electrical Characteristics

Total Resistance	5KΩ~100KΩ
Total Resistance Tolerance	±20%;
Resistance Taper	B Taper
Rated Power	Taper B: 0.0125W
Withstand Voltage	1 minute at AC 250V
Insulation Resistance	≥ 100MΩ at DC 250V 1minute
Max. Operating Voltage	AC 50V or DC 5V

Mechanical Characteristics

Figure of Lever Operation	Circular Operating
Stopper Strength	310mN·m Min. 3sec
Rotational Stopper Strength	200mN·m Min.
Operating Angle of lever	55° ±6°
Push-pull Strength	Push/Pull:50N Min. 3sec
Operating Force	11±4mN·m
Accuracy of Rest Position	±5°

Tact Switch Specification

Ratings	12V DC, 50 mA
Operating Force	82±26mN·m
Travel	0.5+0.5/-0.4mm
Operating Life	100,000 cycles

Durability

Rotational Life	Standard life: 1,000,000 cycles Long life: 2,000,000 cycles
Operating Temperature Range	-10° C~+70° C

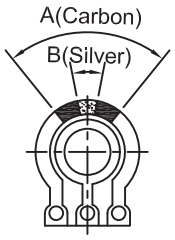
HOW TO ORDERD

FJM10K-	N	1	B	100K	29	8
Model Series	Switch Option	Shaft Length	Resistance Taper	Total Resistance	Electric Effective Angle	Operation Life
	N: No Switch S: with Tact Switch	1: L7.2 2: L12.0	B: Linear(0B)	5K 10K 20K 50K 100K	See Note 1	(Blank): Std Life 8: Long Life

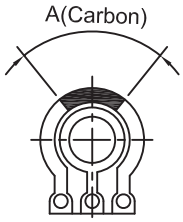
Note1: Electric Effective Angle

ANGLE A	ANGLE B	Code
45°	3°	01
50°	6°	02
40°	6°	03
60°	6°	04
45°	6°	05
38°	6°	06
35°	6°	07
32°	6°	08
30°	6°	09

ANGLE A	ANGLE B	Code
32°	4°	14
38°	8°	15
76°	8°	16
45°	8°	18
25°	6°	21

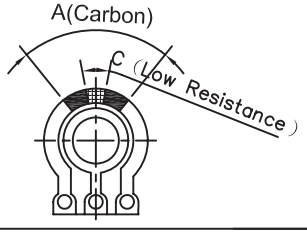


ANGLE A	Code
30°	A0
32°	A2
35°	A5
38°	A8
40°	B0
45°	B5
50°	C0
60°	D0



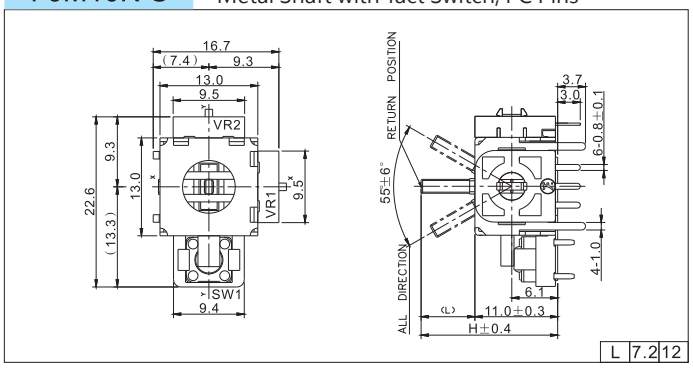
ANGLE A	ANGLE C	Code
45°	6°	11
38°	9°	12
45°	9°	13
54°	6°	23

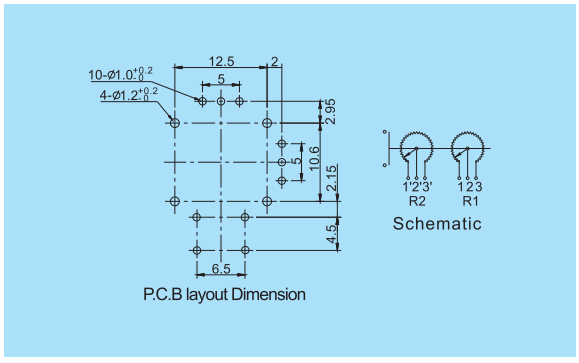
ANGLE A	ANGLE C	Code



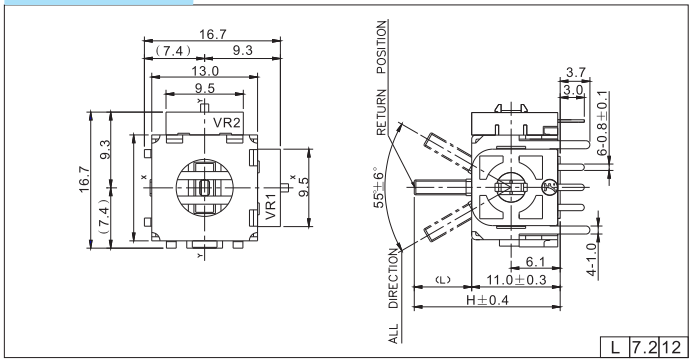
碳膜层 (Carbon) 硫化层 (Anti-Sulfurated) 银层 (Silver) 低碳层 (Low Resistance)

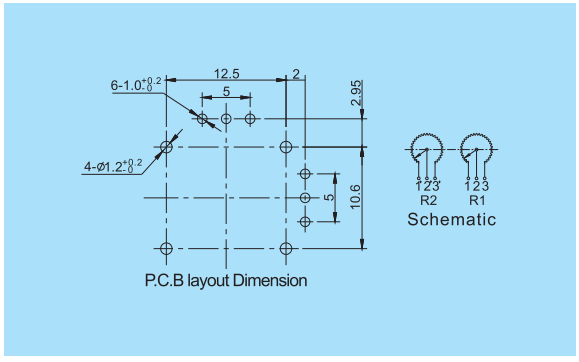
FJM10K-S Metal Shaft with Tact Switch, PC Pins





FJM10K-N Metal Shaft, No Switch, PC Pins





FJN08K Series Joystick Potentiometer

Feature

1. Superior operational feeling free from gaps in operating diections ideal for finger-tip operation.
2. Integrated tact switch for selection contributes to the improvement of user-friendliness of the set.
3. Long life type available.

FJN08K Series Joystick Potentiometer.

Application:

- Gamepad
- Model Airplane
- Remote control products

Electrical Characteristics

Total Resistance	10K
Total Resistance Tolerance	±20%;
Resistance Taper	B Taper
Rated Power	Taper B: 0.0125W
Withstand Voltage	1 minute at AC 250V
Insulation Resistance	≥ 100MΩ at DC 250V
Noise	≤300mV

Mechanical Characteristics

Figure of the Slide Bar Operation	Slide on the 2D Flat
Stopper Strength of the Slide Bar	≥30N for 3sec Min.
Pull Strength of the Slide Bar	≥30N for 3sec Min.
Push Strength of the Slide Bar	≥30N for 3sec Min.
Travel of the Slide Bar	2mm
Operating Force of Slide Bar	0.6±0.2N

Durability

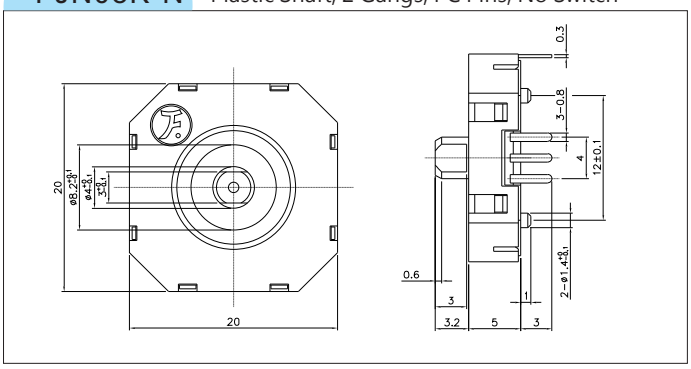
Rotational Life	2,000,000 cycles
Operating Temperature Range	-10° C~+70° C

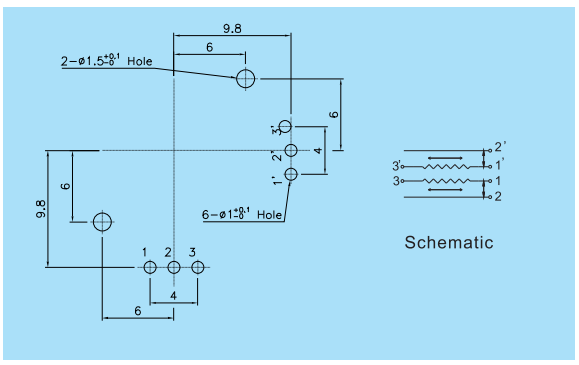
HOW TO ORDERD

FJN08K	N	1	B	10K	1

Model Series	Terminal Configuration	Carbon Track Design	Resistance Taper	Total Resistance
	N: Top Adjust, PC Pins	0: 4mm Carbon Film	B: Linear(0B)	10k
	P: SMD Type	1: 4mm Carbon Film with 0.4mm Silver Layer in the Middle		

FJN08K-N Plastic Shaft, 2 Gangs, PC Pins, No Switch





FJN10K Series Joystick Potentiometer

Feature

1. Superior operational feeling free from gaps in operating diections ideal for finger-tip operation.
2. Integrated tact switch for selection contributes to the improvement of user-friendliness of the set.
3. Long life type available.

FJN10K Series Joystick Potentiometer.

Application:

- Gamepad
- Model Airplane
- Remote control products

Electrical Characteristics

Total Resistance	5KΩ~100KΩ
Total Resistance Tolerance	±20%;
Resistance Taper	B Taper
Rated Power	Taper B: 0.0125W
Withstand Voltage	1 minute at AC 250V
Insulation Resistance	≥ 100MΩ at DC 250V 1minute
Max. Operating Voltage	AC 50V or DC 5V

Tact Switch Specification

Ratings	12V DC, 50 mA
Operating Force	8.2±2.6N
Travel	0.5+0.5/-0.4mm
Operating Life	100,000 cycles

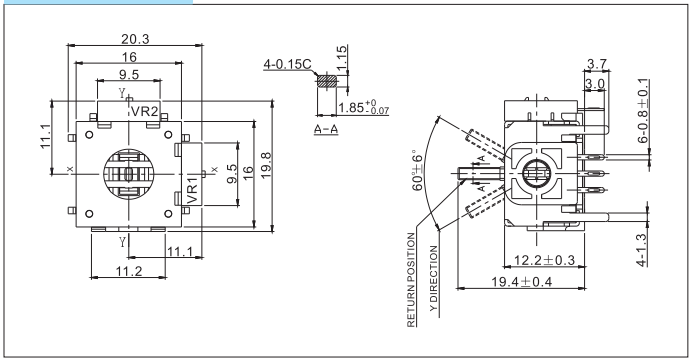
Mechanical Characteristics

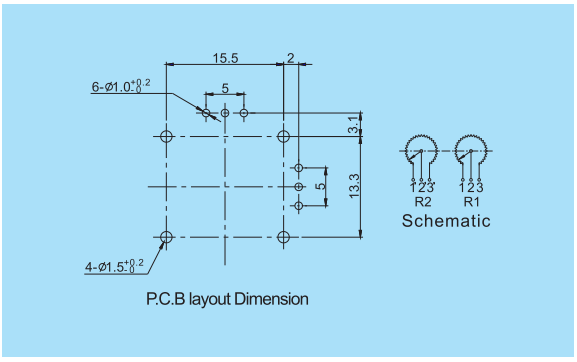
Figure of Lever Operation	Circular Operating
Stopper Strength	310mN·m Min. 3sec
Rotational Stopper Strength	200mN·m Min.
Operating Angle of lever	60° ±6°
Push-pull Strength	Push/Pull:50N Min. 3sec
Operating Force	16±4mN·m
Accuracy of Rest Position	±5°

Durability

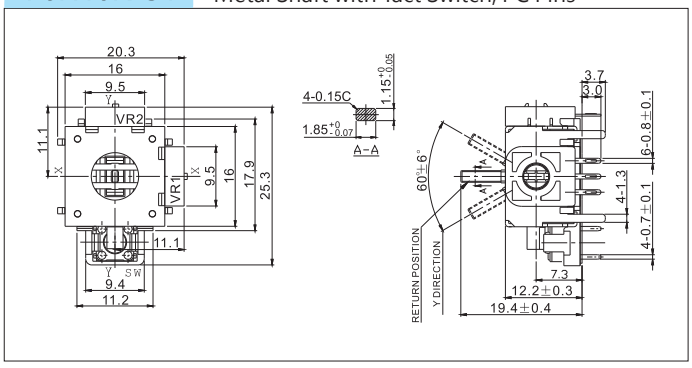
Rotational Life	Standard life: 1,000,000 cycles Long life: 2,000,000 cycles
Operating Temperature Range	-10° C~+70° C

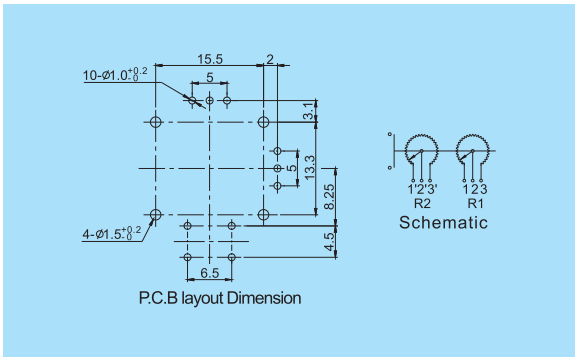
FJN10K-N1 Metal Shaft, No Switch, PC Pins





FJN10K-S1 Metal Shaft with Tact Switch, PC Pins





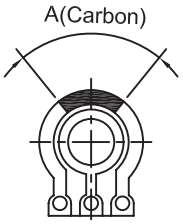
HOW TO ORDERD

FJN10K	N	1	B	100K	29	8

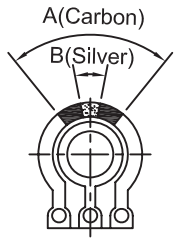
Model Series	Switch Option	Shaft Length	Resistance Taper	Total Resistance	Electric Effective Angle	Operation Life
	N: No Switch S: with Tact Switch	1: L7.2	B: Linear(0B)	5K 10K 20K 50K 100K	See Note 1	(Blank): Std Life 8: Long Life

Note1: Electric Effective Angle

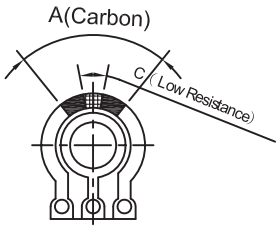
ANGLE A	Code	ANGLE A	Code	ANGLE A	Code	ANGLE A	Code
15°	e5	45°	B5				
20°	d0	50°	C0				
25°	d5	53°	C3				
28°	d8	55°	C5				
30°	A0	60°	D0				
32°	A2	65°	D5				
35°	A5						
38°	A8						
40°	B0						



ANGLE A	B	Code	ANGLE A	B	Code	ANGLE A	B	Code	ANGLE A	B	Code
60°	6°	01	30°	6°	11	40°	6°	20	45°	8°	48
38°	6°	03	50°	8°	12	25°	12°	22	32°	8°	51
38°	8°	04	85°	8°	13	35°	6°	26	20°	6°	52
50°	6°	05	100°	8°	14	40°	3°	30	45°	10°	55
53°	6°	06	80°	10°	15	147°	3°	32	$48^{\circ}{}^{+0}_{-3^{\circ}}$	6°	56
45°	3°	07	60°	10°	16	70°	6°	33	45°	6°	73
32°	3°	08	25°	6°	17	28°	6°	34	46°	8°	74
53°	8°	09	50°	3°	18	35°	8°	35			
45°	5°	10	45°	15°	19	42°	8°	44			



ANGLE A	C	Code	ANGLE A	C	Code	ANGLE A	C	Code	ANGLE A	C	Code
45°	12°	25	35°	8°	38	45°	10°	54	53°	12°	64
38°	8°	27	50°	6°	42	35°	5°	60			
45°	5°	28	40°	6°	43	54°	6°	59			
60°	5°	29	53°	10°	47	60°	10°	66			
40°	12°	31	30°	8°	53	32°	6°	71			



碳膜层 (Carbon) 硫化层 (Anti-Sulfurated) 银层 (Silver) 低碳层 (Low Resistance)

FJP06K Series Joystick Potentiometer

Feature

1. Ultra-thin type Joystick. Ideal for mobile gaming device with high concern of product thickness. Body height is 6mm.
2. Optional switch feature.
3. Long operation life-200 million cycles.

FJP06K Series Joystick Potentiometer.

Application:

- Gamepad
- Model Airplane
- Remote control products

Electrical Characteristics

Total Resistance	5KΩ~100KΩ
Total Resistance Tolerance	±20%;
Resistance Taper	B Taper
Rated Power	Taper B: 0.0125W
Withstand Voltage	1 minute at AC 250V
Insulation Resistance	≥ 100MΩ at DC 250V 1minute
Max. Operating Voltage	AC 50V or DC 5V

Tact Switch Specification

Ratings	12V DC, 50 mA
Operating Force	6±1.5N
Travel	0.24+0.2mm
Operating Life	500,000 cycles

Mechanical Characteristics

Figure of Lever Operation	Circular Operating
Stopper Strength	310mN·m Min. 3sec
Operating Angle of lever	40° ±5°
Push-pull Strength	Push: 30N Min.3sec Pull: 50N Min. 3se
Operating Force	12±4mN·m
Accuracy of Rest Position	±5°

Durability

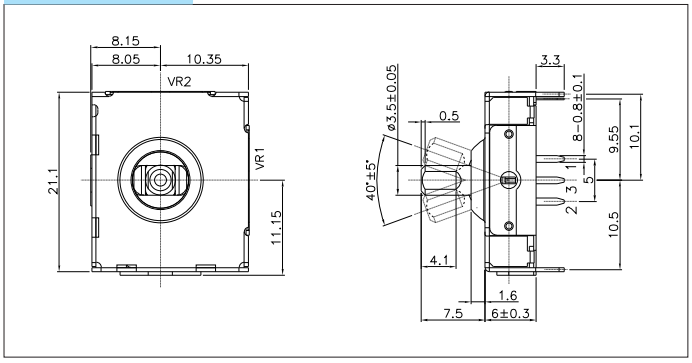
Rotational Life	Standard life: 1,000,000 cycles Long life: 2,000,000 cycles
Operating Temperature Range	-10° C~+70° C

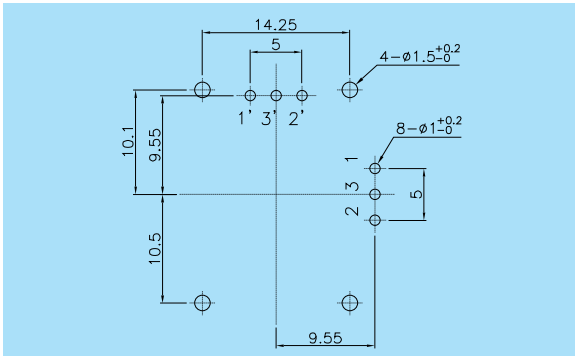
HOW TO ORDERD

FJP06K-	N	1	B	10K	B0	1

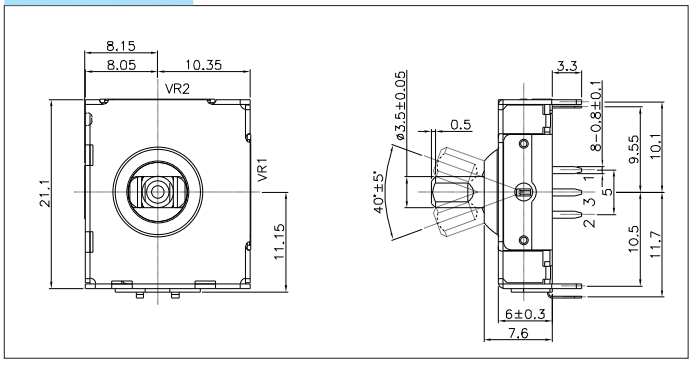
Model Series	Switch Option	Shaft Length	Resistance Taper	Total Resistance	Electric Effective Angle	Operation Life
	N: No Switch S: with Tact Switch	1: L5.9	B: Linear(0B)	5K 10K 20K 50K 100K	40°	(Blank): Std Life 8: Long Life

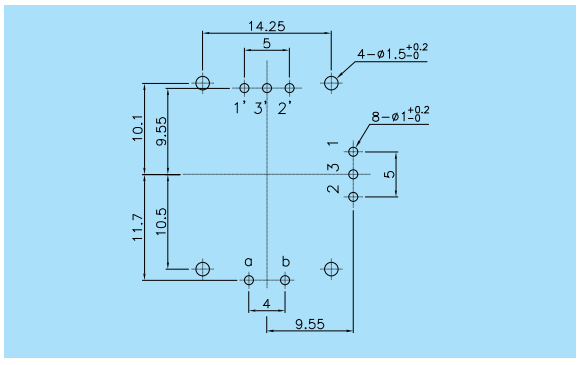
FJP06K-N





FJP06K-S





FJP10K Series Joystick Potentiometer

Feature

1. Superior operational feeling free from gaps in operating diections ideal for finger-tip operation.
2. Integrated tact switch for selection contributes to the improvement of user-friendliness of the set.
3. Long life type available.

FJP10K Series Joystick Potentiometer.

Application:

- Gamepad
- Model Airplane
- Remote control products

Electrical Characteristics

Total Resistance	5KΩ~100KΩ
Total Resistance Tolerance	±20%;
Resistance Taper	B Taper
Rated Power	Taper B: 0.0125W
Withstand Voltage	1 minute at AC 250V
Insulation Resistance	≥ 100MΩ at DC 250V 1minute
Max. Operating Voltage	AC 50V or DC 5.0V

Mechanical Characteristics

Figure of Lever Operation	Circular Operating
Stopper Strength	310mN·m Min. 3sec
Operating Angle of lever	66° ±6°
Push-pull Strength	Push/Pull: 50N Min. 3se
Operating Force	16±4mN·m
Accuracy of Rest Position	±5°

Tact Switch Specification

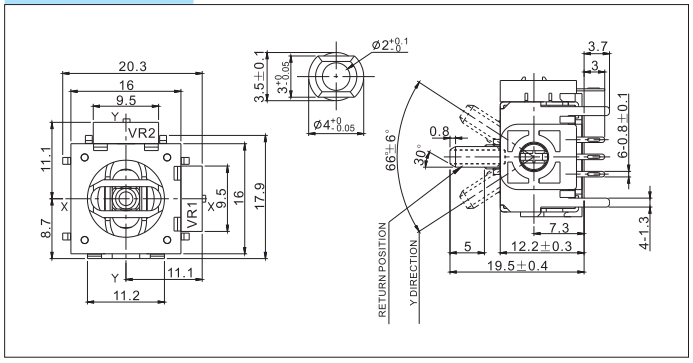
Ratings	12V DC, 50 mA
Operating Force	8.2±2.6N
Travel	0.5+0.5/-0.4mm
Operating Life	100,000 cycles

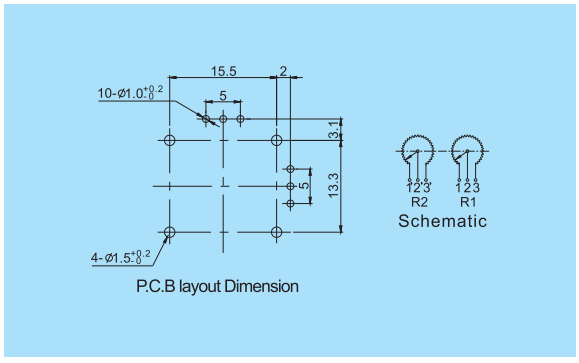
Durability

Operating Life	Standard life: 1,000,000 cycles Long life: 2,000,000 cycles
Operating Temperature Range	-10° C~+70° C

FJP10K-N1

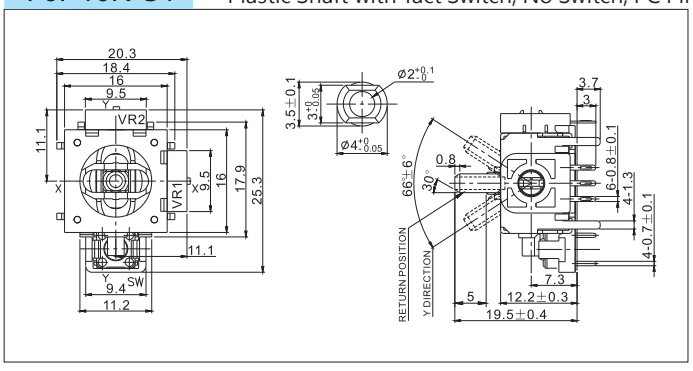
Plastic Shaft, No Switch, PC Pins

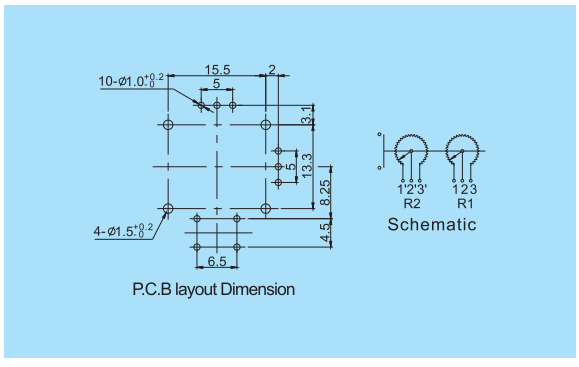




FJP10K-S1

Plastic Shaft with Tact Switch, No Switch, PC Pins





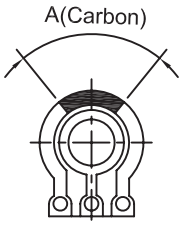
FJP10K Series Joystick Potentiometer

HOW TO ORDERD

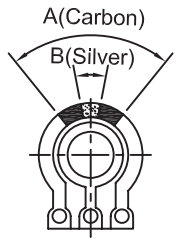
FJP10K-	N	1	B	100K	29	1
Model Series	Switch Option	Shaft Length	Resistance Taper	Total Resistance	Electric Effective Angle	Operation Life
	N: No Switch S: with Tact Switch	1: L7.3	B: Linear(0B)	5K 10K 20K 50K 100K	See Note 1	(Blank): Std Life 8: Long Life

Note1: Electric Effective Angle

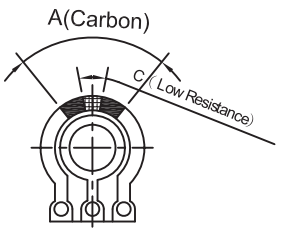
ANGLE A	Code	ANGLE A	Code	ANGLE A	Code	ANGLE A	Code
15°	e5	45°	B5				
20°	d0	50°	C0				
25°	d5	53°	C3				
28°	d8	55°	C5				
30°	A0	60°	D0				
32°	A2	65°	D5				
35°	A5						
38°	A8						
40°	B0						



ANGLE A	B	Code	ANGLE A	B	Code	ANGLE A	B	Code	ANGLE A	B	Code
60°	6°	01	30°	6°	11	40°	6°	20	45°	8°	48
38°	6°	03	50°	8°	12	25°	12°	22	32°	8°	51
38°	8°	04	85°	8°	13	35°	6°	26	20°	6°	52
50°	6°	05	100°	8°	14	40°	3°	30	45°	10°	55
53°	6°	06	80°	10°	15	147°	3°	32	$48°^{+0}_{-3°}$	6°	56
45°	3°	07	60°	10°	16	70°	6°	33	45°	6°	73
32°	3°	08	25°	6°	17	28°	6°	34	46°	8°	74
53°	8°	09	50°	3°	18	35°	8°	35			
45°	5°	10	45°	15°	19	42°	8°	44			



ANGLE A	C	Code	ANGLE A	C	Code	ANGLE A	C	Code	ANGLE A	C	Code
45°	12°	25	35°	8°	38	45°	10°	54	53°	12°	64
38°	8°	27	50°	6°	42	35°	5°	60			
45°	5°	28	40°	6°	43	54°	6°	59			
60°	5°	29	53°	10°	47	60°	10°	66			
40°	12°	31	30°	8°	53	32°	6°	71			



碳膜层 (Carbon)　硫化层 (Anti-Sulfurated)　银层 (Silver)　低碳层 (Low Resistance)

FH06K Series Joystick Potentiometer

Feature

1. Miniature design, perfectly suit mobile devices or products with limited inner room for joysticks.
2. Contactless Hall-effect technology. Operation life can achieve more than 2,000,000 cycles.
3. Outstanding hand feeling. Not compromised for the miniature design.

Application:

- Portable game machine
- Miniature bluetooth gamepad
- Smart TV controller

Recommended model:

♦ FJH06K-S11 ♦ FJH06-N11

Electrical Characteristics

Operating Voltage	VDD=DC 3.3V~5.0V
Operating Current	I≦10m A
Output Voltage	Vout=DC 0.25V~4.75V
Rated Power	W=0.05W
Operating Temperature	-30℃~60℃
Voltage Divider Error	42% ~ 58%

Switch Characteristics

Operating Force	600±15 mN·m
Travel	0.14±0.1mm
Push Strength	30N, 60sec
Operating Life	500,000 Cycles

Endurance Characteristics

Dry Heat	+60 ±2℃, Time: 96 hr
Cold	-30 ±2℃, Time: 96 hr
Damp Heat	+60 ± 2℃ Humidity: 90~95% RHTime: 96 hr
Resistance to Soldering Heat	350℃ for 3 sec
Operating Life	2,000,000 Cycles

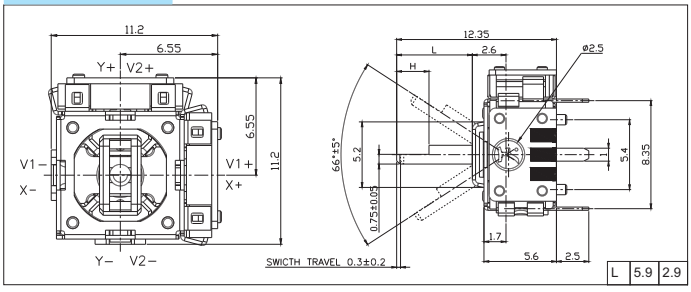
Mechanical Characteristics

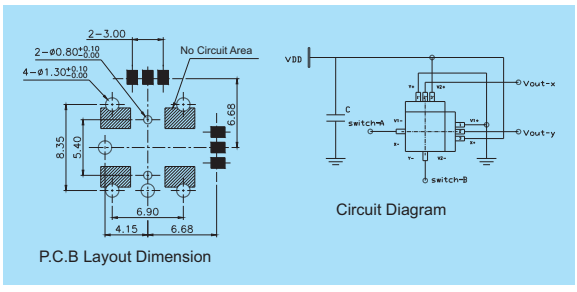
Figure of Lever Operation	Circular operating
The Stopper Strength of The Lever	More than 30N, 3 sec Min.
Pull Strength of Lever	More than 50N, 3 sec Min.
Push Strength of lever	More than 30N, 3 sec Min.
Operating Force of Lever	5±3mN·m
Lever Return Precision	±5°
Operating Angle	66°±5°

HOW TO ORDERD

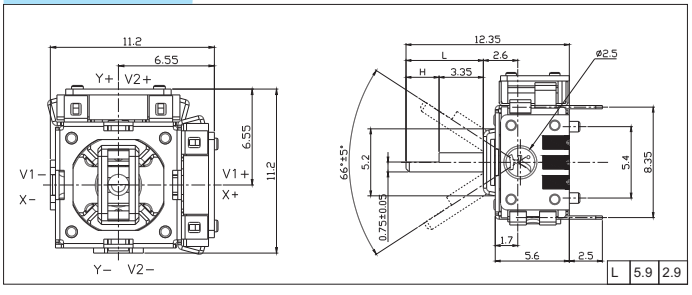
FJH06K-	S	1	1
Model Series	Switch Type	Shaft Length	Terminal Style
	N: No Switch	1: L5.9mm	1: Surface Mount
	S: With Tact Switch	2: L2.9mm	

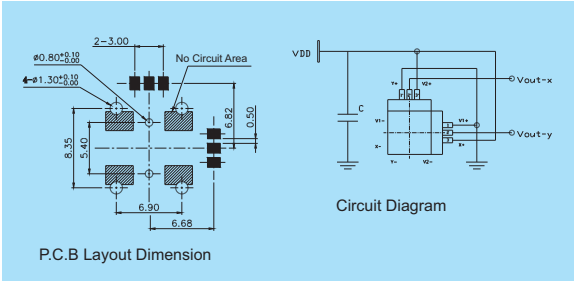
FJH06K-S Metal Shaft with Tact Switch





FJH06K-N Metal Shaft, No Switch





FSE07 Series Rotary Position Sensor

Feature

1. Dust-proof construction protects the interior from dust, which maintains stable characteristics.
2. High accuracy and long life over 1 million cycles.
3. Stable output characteristics can be secured for external noise and temperature changes.

FSE07 Series Position Sensor.

Application:

- Automobile Seat Adjustment
- Automobile Light Adjustment

Electrical Characteristics

Total Resistance	500Ω~1MΩ
Total Resistance Tolerance	±20%;
Resistance Taper	B Taper
Rated Voltage	DC 5V or AC 50V
Rated Power	0.01W
Linearity Tolerance	≤ ±2%
Sliding Noise	≤ 300mV
Insulated Resistance	≥ 100MΩ at DC 250V 1minute
Withstand Voltage	AC 250V, for 1 Minute

Mechanical Characteristics

Total Rotational Angle	360° Continuous
Rotational Torque	≤5mN·m
Pull Strength of Rotational Shaft	5N Min.

Environmental Characteristics

Storage Temperature	-40° C~+70° C
Operating Temperature	-10° C~+70° C
Dry Heat	70±2° C , 240±2hr, ▵ TR+5%/-30%
Damp Heat	70±2° C , 240±2hr, ▵ TR+5%/-30%
Cold	-30±2° C , 300±5hr, without Load ▵ TR+35%-5%
Temperature Cycles	-10° C~+70° C , 5cycles, ▵ TR≤±10%
Rotational Life	Standard life: 500,000 cycles Long life: 1,000,000 cycles
Temperature Characteristics	70±3° C , 5hr, ▵ TR+5%/-20%
Soldering Condition	Wave Soldering: 260±5° C 5sec Max; Manual Soldering: 350±10° C 3sec Max.
Operating Temperature Range	-10° C~+70° C

HOW TO ORDERD

FSE07-	01	H	1	B	5K	R0	1

Model Series

Product Type
- 01: Product Standard

Terminal Configuration
- H: Top Adjust, PC Pins
- V: Side Adjust, PC Pins

Terminal Length
- Top Adjust
- 1: 2.1 mm
- 2: 6.4 mm
- 3: 9.5 mm
- Side Adjust
- 1: 11.8mm

Resistance Taper
- B: Linear (0B)

Terminal Length

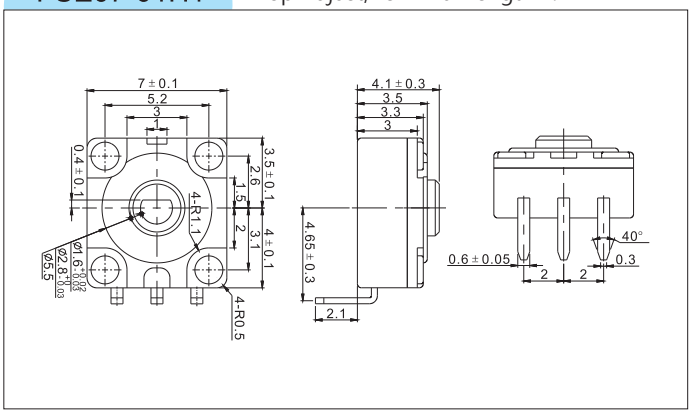
1K	2K
5K	10K
20K	50K
100K	200K
500K	1MEG

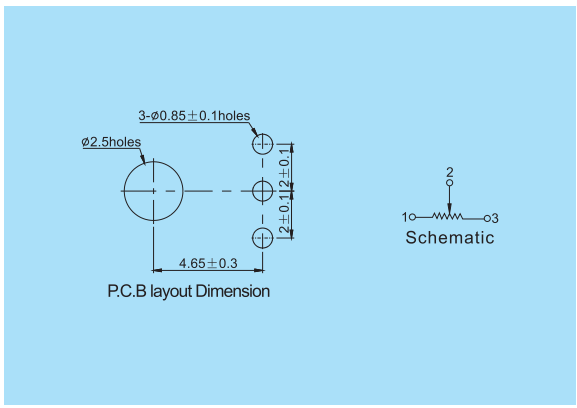
Electric Angle Code
- P0: 180°
- R0: 200°
- Z0: 280°
- f0: 310°

Operation Life
- (Blank): Std Life w/o Anti-sulfur
- 1: Std Life w/ Anti-sulfur
- 6: Long Life w/ Anti-sulfur
- 7: Long Life w/o Anti-sulfur

FSE07-01H1

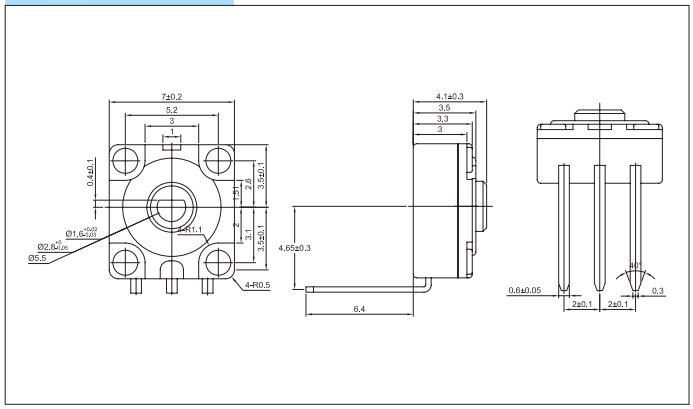
Top Adjust, Terminal Length 2.1mm

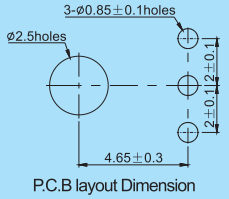


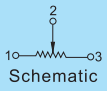


FSE07-01H2

Top Adjust, Terminal Length 6.4mm

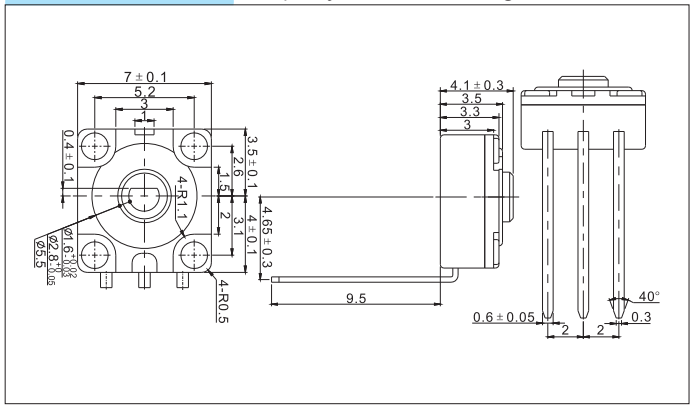


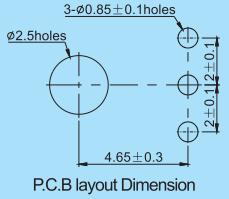


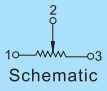


FSE07-01H3

Top Adjust, Terminal Length 9.5mm







FSE10 Series Slide Position Sensor

Feature

1. High reliability.
2. Simple construction (only 4 component parts).
3. ROHS compliant and lead free wave soldering.
4. Long life, over 300,000cycles.

FSE10 Series Position Sensor.

Application:

- Automotive Seat Position Memory
- Automobile Headlamp Leveling Position Sensors.
- Automobile Rear-view Mirror Position Sensors.

Electrical Characteristics

Resistance Range	1KΩ~100KΩ
Total Resistance Tolerance	±20%;
Taper Style	B Taper
Rated Power	0.2W @ 50° C
Independent Linearity	±2%
Max. Voltage	DC 30V
Contact Noise	within 10% TR

Environmental Characteristics

Storage Temperature	-40° C~+105° C
Operating Temperature	-40° C~+105° C
Life Cycles	200,000 cycles
Heat Resistance	105±2° C , 96hr, ▵ TR: ±20%, Linearity: ±3%
Cold Resistance	-40±3° C , 96hr, ▵ TR: ±20%, Linearity: ±3%
Humidity Resistance	60±2° C , 90~95RH, 100hr, ▵ TR: ±20%, Linearity: ±3%
Temperature Cycles	-40° C~+105° C , 5cycles, ▵ TR: ±20%, Linearity: ±3%

Mechanical Characteristics

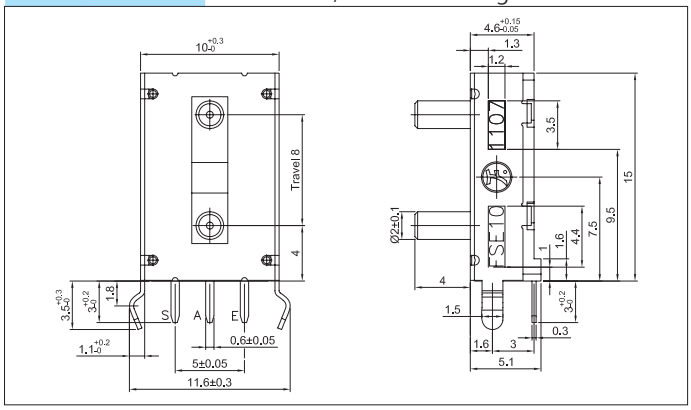
Mechanical Travel	8mm
Electrical Travel	6.4mm
Slide Torque	2N Max.
Push Pull Strength of Lever	Push: 50N Min.; Pull: 20N Min.
Stopper Strength	30N Min. , 5sec

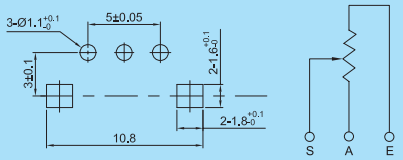
HOW TO ORDERD

FSE10-	01	8	4	B	4K7

Model Series	Product Type	Travel	Length of Lever	Resistance Taper	Total Resistance				
	01: Slide Adjust	8: 8mm(Slide Adjust)	4: 4mm	B: Linear (0B)	1K	2K	5K	10K	20K
	02: Top Adjust	9: 9mm(Adjust Top)			50K	100K	200K	500K	1MEG

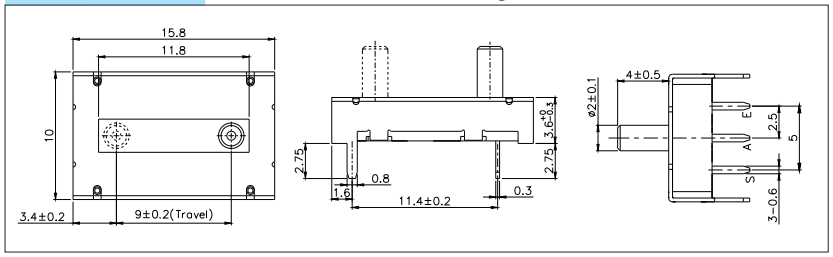
FSE10-0184 8mm Travel, 4mm Lever Length

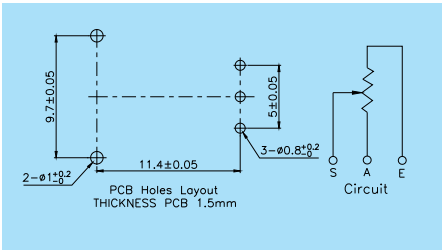




P.C.B layout Dimension Schematic

FSE10-0294 9mm Travel, 4mm Lever Length





FSE11 Series Rotary Position Sensor

Feature

1. Dust-proof construction protects the interior from dust, which maintains stable characteristics.
2. Compliant to reflow high peak temperature lead free soldering.
3. Excellent resistance materials and high reliability wiper acheieves 1,000,000 cycles.
4. Ultra-thin size.(2.2mm height)

FSE11 Series Position Sensor.

Application:

- Animal Robot Joint Controller
- HAVC Sensor
- Motor Drive Unit
- Electric Motor-Driven Bicycle
- Rotary Angle Sensor

Electrical Characteristics

Resistance Range	1KΩ~100KΩ
Total Resistance Tolerance	±20%;
Taper Style	B Taper
Rated Power	0.1W
Linearity	> 200° ±2%; ≤200° ±3%
Rotational Noise	Less than 80 mv
T.C.R	±500ppm/° C

Environmental Characteristics

Storage Temperature	-40° C~+120° C
Operating Temperature	-40° C~+120° C
Life Cycles	1,000,000 cycles
Dry Heat	120±3° C , 250±8hr, △ TR: ±20%, Linearity: ±2%
Cold Resistance	-40±3° C , 168±4hr, △ TR: ±20%, Linearity: ±2%
Humidity Resistance	60±2° C , 90~95RH, 250±8hr, △ TR: ±20%, Linearity: ±2%
Temperature Cycles	-40° C~+120° C , 5cycles, △ TR: ±20%, Linearity: ±2%

Mechanical Characteristics

Effective Electrical Angle	333+3°
Rotational Torque	0~3mN·m
Push-pull Strength of Shaft	Over 1.0kgf for 10sec Min.
Total Rotational Angle	360° (Endless)

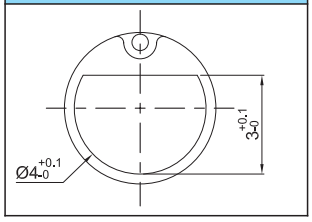
HOW TO ORDERD

FSE11-	01	D	B	5K	g0

Model Series	Product Type	Rotor Style	Resistance Taper	Total Resistance	Electric Angle Code
	01: SMD Type	See Note 1	B: Linear (0B)	1K 2K 5K 10K 20K 50K 100K	See Note 2

Note 1: Rotor Style

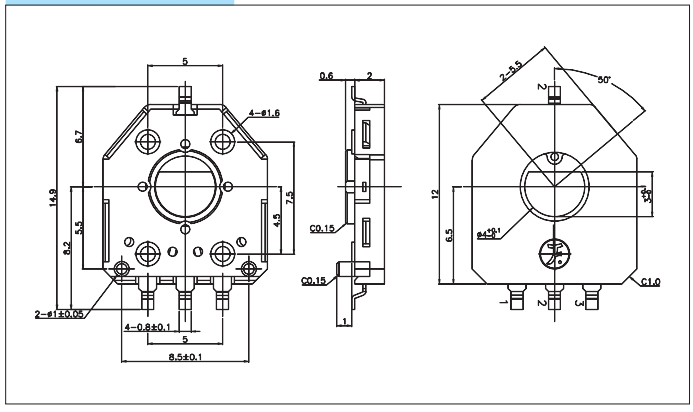
D-Type

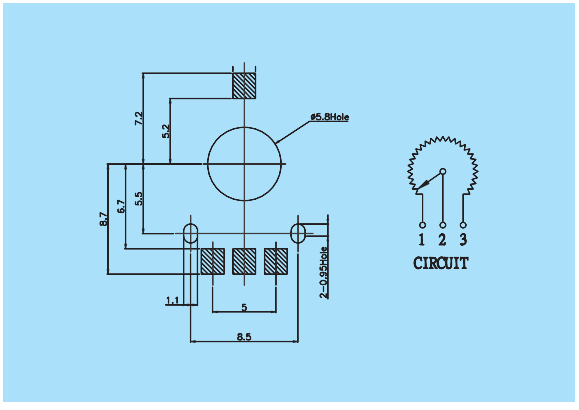


Note2: Code of Electric Angle

Code	P0	W0	g0	h3
Angle	180°	250°	320°	333°

FSE11-01D SMD Type with D Type Rotor





FSE28 Series Rotary Position Sensor

Feature

1. Dust-proof construction protects the interior from dust, which maintains stable characteristics.
2. FR-4 element materials compliant to flow high peak temperature lead free soldering.
3. ROHS compliant and lead free wave soldering.
4. Long life, over 200,000cycles.

FSE28 Series Position Sensor.

Application:

- HVAC Sensor
- Rotary Angle Sensor

Electrical Characteristics

Resistance Range	1KΩ~100KΩ
Total Resistance Tolerance	±20%;
Taper Style	B Taper
Rated Power	0.1W
Linearity	±2%
Contact Noise	within 10% TR
Rated Voltage	DC 5V ± 0.5V

Environmental Characteristics

Storage Temperature	-40° C~+85° C
Operating Temperature	-40° C~+85° C
Life Cycles	200,000 cycles
Dry Heat	85±3° C , 168±4hr, ▵ TR: ±40%, Linearity: ±3%
Cold Resistance	-40±3° C , 168±4hr, ▵ TR: ±40%, Linearity: ±3%
Humidity Resistance	60±2° C , 90~95RH, 100±4hr, ▵ TR: ±40%, Linearity: ±3%
Temperature Cycles	-40° C~+85° C , 5cycles, ▵ TR: ±40%, Linearity: ±3%

Mechanical Characteristics

Electrica Angle	250° ±3
Rotational Torque	0~5mN·m
Push Pull Strength of Shaft	10N for 10sec Min.
Total Rotational Angle	360° (Endless)

HOW TO ORDERD

FSE28-	01	G	B	5K	J0

Model Series

Terminal Style
- 01: Standard
- 02: Customized
- See Note1

Rotor Style
- See Note 2

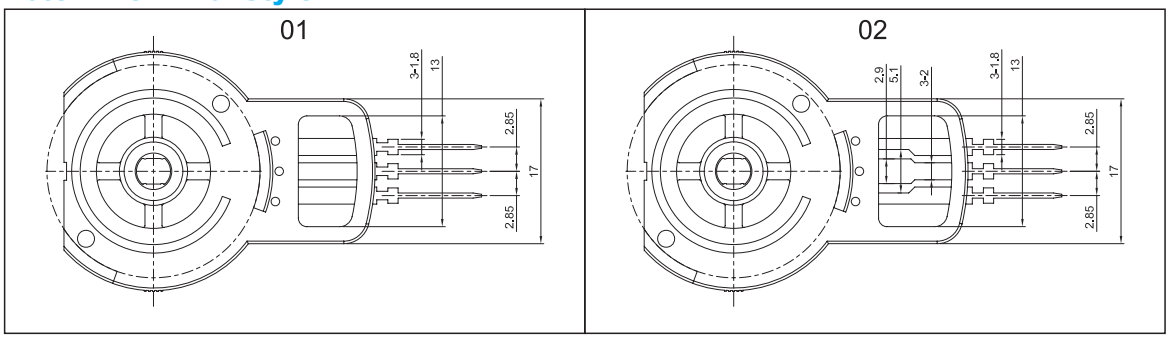
Resistance Taper
- B: Linear (0B)

Total Resistance

1K	2K	4K7	5K	10K	20K	50K	100K

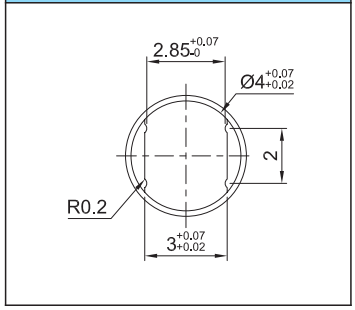
Electric Angle Code
- See Note 3

Note 1: Terminal Style



Note 2: Rotor Style

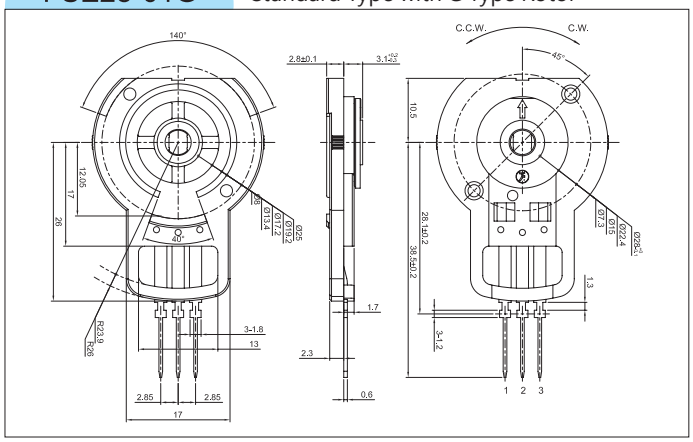
G-Type: (Hollow Shaft)

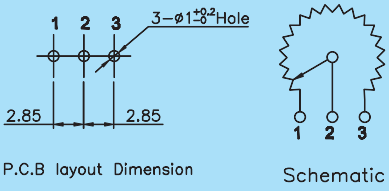


Note3: Code of Electric Angle

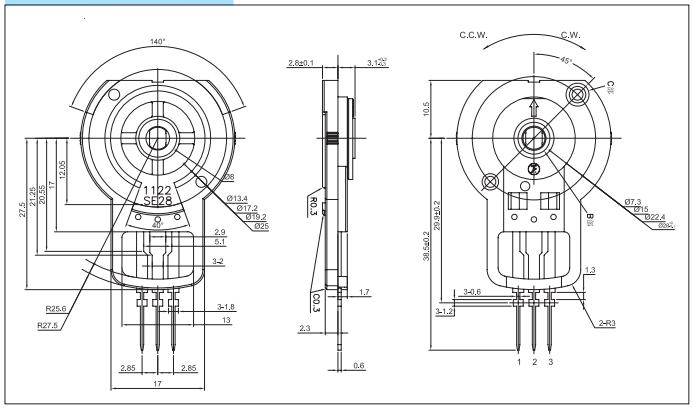
Code	J0	M8	N0	O0	P0	U5	W0
Angle	120°	158°	160°	170 °	180 °	235 °	250 °

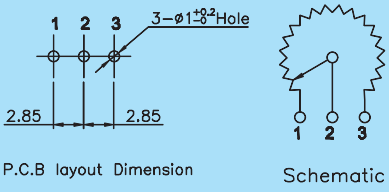
FSE28-01G Standard Type with G Type Rotor





FSE28-02G Standard Type with G Type Rotor





FHS22 Series Hall Effect Rotary Sensor

Feature

1. Non-comtact angle/position sensor.
2. Long life, over 10 million cycles.
3. Programmable angular range from 15 to 360 degrees(without dead band).
4. Simple & robust magnetic design.

FHS22 Series Contactless Sensor.

Application:

- Throttle/speed control
- Foot pedal position
- Tilt position
- Manipulator arm position

Electrical Characteristics

Output Voltage	0.25Vdc to 4.75Vdc typical(see Voltage Output Codes)
Output Current	±8mA Max.
Input Voltage	5Vdc ± 10%
Supply Current	±7.5mA Typical, 11mA Max.
Independent Linearity	±0.5% (±0.25% Available)
Output load	10KΩ Typical, 1KΩ Min
Output Temperature Characteristics	within ±3% Vout/FS
Effective Electrical Angle	15° to 360° (360° is Typical)
Insulation resistance	100MΩ Min. , DC 500V

Environmental Characteristics

Storage Temperature	-55° C~+125° C
Operating Temperature	-40° C~+125° C
Rotational Life	10 Million cycles Min. (with bushing bearing)
Shock	Per MILR-39023, 6ms Saw-tooth 100G's, 18times
Vibration	Per MILR-39023, 10G's, 100 to 500Hz, 12Hrs
ESD	8 KV Max.(Human Body Model) 15KV air discharge.
EMI	100V/m, 200MHz~1GHz
Soldering Condition	Manual solder:350° Max. , 3sec. Max.
IP Grade	IP50 Standard IP65 Option Available
Exposure at High Temperature	1000hr at +125° C
Exposure at Low Temperature	24 hr at -50° C

Mechanical Characteristics

Rotational Torque	within 5mN·m; within 20mN·m (O-ring seal)
Total Rotational Torque	360° (Endless)
Push Strength	100N Min.
Pull Strength	100N Min.
Shaft Material	Stainless Steel
Bushing Material	Phosphor Bronze

HOW TO ORDERD

FHS22-	W	W	A	S	1	1	A	360	A

Model Series

Terminal Option
W: with Cable wire

Proof Option
D: Dustproof (IP50)
W: Waterproof (Ip65)

Bushing Option
A: 1/4 Shaft,3/8 Bushing

Shaft Type & Length
See Note 1

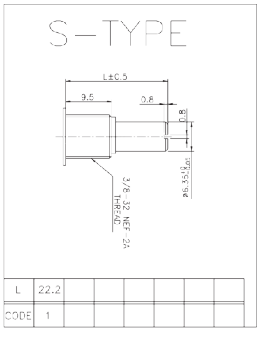
Voltage output code
1: DC 0.2V to 4.8V
2: DC 0.25V to 4.75V
3: DC 0.5V to 4.5V
4: DC 0.75V to 4.25V
5: DC 1.0V to 4.0V

Output Function
See Note 2

Electric Angle
90: 90°
180: 180°
270: 270°
360: 360°

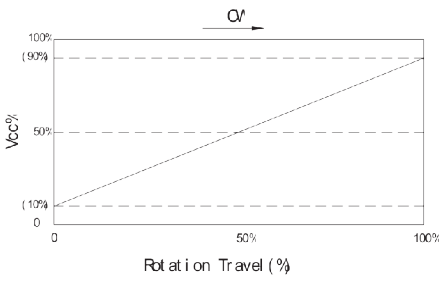
Linearity Tolerance
A: ±0.5%

Note 3: Shaft Type and Lengths

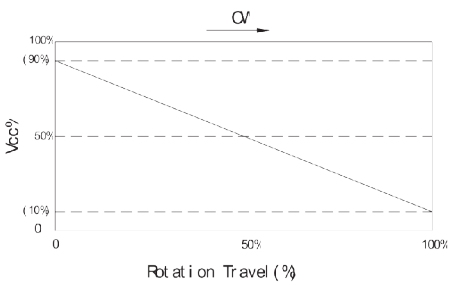


Note 2: Output Function

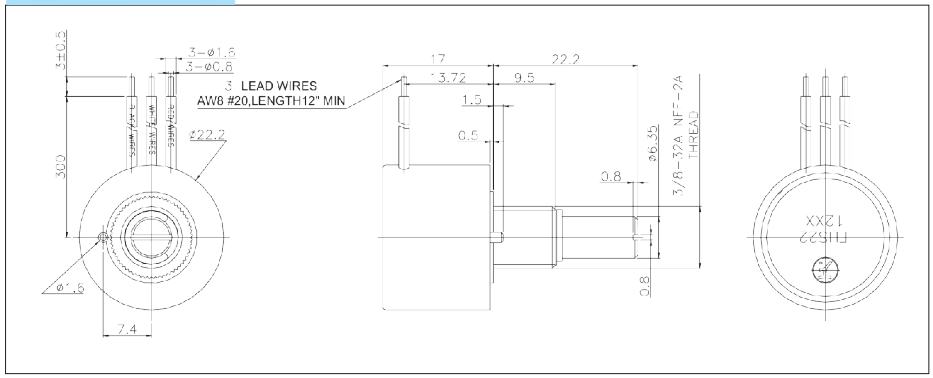
A-Type

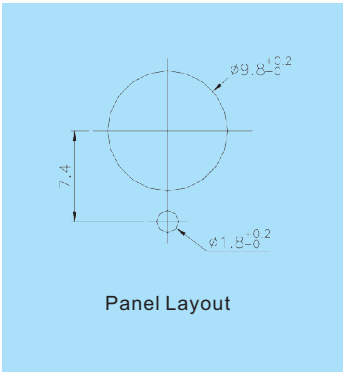


B-Type



FHS22-WWA





Panel Layout

FHS50 Series Hall Effect Sensor

Feature

1. Compact units, high responsive.
2. Superb prorortional control.
3. Longlife, 10 million cycles min.
4. EMC protected, sealed to Ip65

FHS50 Series Hall Effect Sensor

Application:

- Wheelchair

Electrical Characteristics

Power Supply	DC5V +/- 10%
Output Voltage at Centre	2.5V +/-120mV
Power Rating	0.1W
Output Voltage at Tap	2.5V ± 80mV
Current Consumption	≤ 20mA
Output Voltage Span	0.5V~4.5V
Centre Tap Impedance	1K
Load Resistance	Over 10 KΩ
Independent Linearity Tolerance	+/-3%
Electrical Deflection Angle	+/-19°
EMC Durability	100V/m

Environmental Characteristics

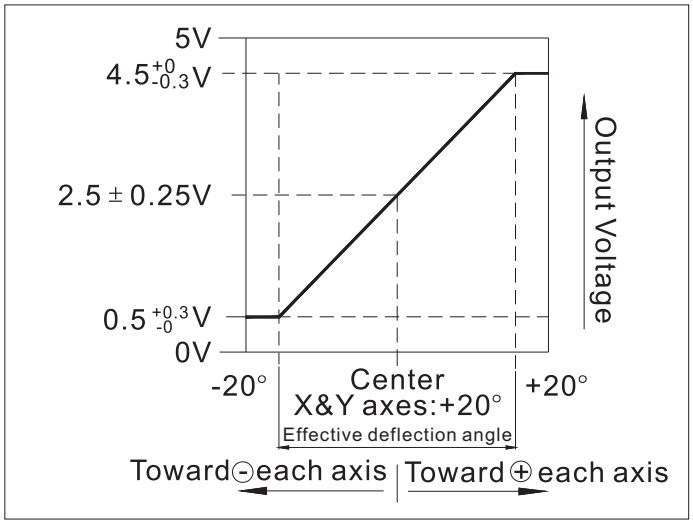
Storage Temperature	-40° C~+70° C
Operating Temperature	-25° C~+70° C
Seal Above Panel	IP65
Life Cycles	10 Million Min.
Dry Heat	80±2° C, 96hr
Cold	-30±2° C, 96hr
Damp Heat	40±2° C, 90~95RH, 96H
Temperature Cycles	-10° C~+60° C, 5cycles

Mechanical Characteristics

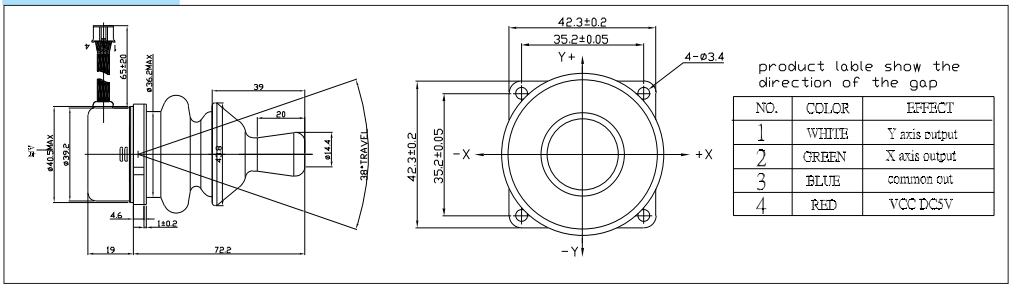
Operating Angle of Angle	38±5°
Operating Force of lever	3.5±1.5N
Pull Strength of Handle	Over 15N for 3sec Min.
Push Strength	100N for 10sec
Stopper Strength of Lever	Over 10Kgf for 3sec Min.

FHS22-	03
Model Series	Style
	03: Side Lead

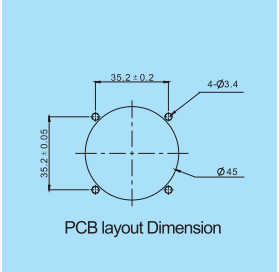
Output Characteristics Carve



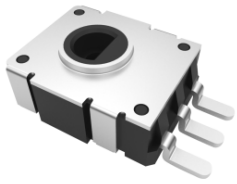
FHS50-03



NO.	COLOR	EFFECT
1	WHITE	Y axis output
2	GREEN	X axis output
3	BLUE	common out
4	RED	VCC DC5V



FSE11 Series Rotary Position Sensor



Feature

1. Angle/Position Sensor with more than 300,000 operating cycles developed for robot joint angle control and game controller L2 R2 position.
2. Miniature design of 4mm width * 5mm length.
3. Excellent smooth operation hand feeling.

Application:

- Robot joint angle control
- Game controller L2 R2 position

Recommended model:

♦ FSE04-P1B5KZ0

Electrical Characteristics

Total Resistance	1K-100K
Resistance Tolerance	±20%
Resistance Taper	B taper
Rated Voltage	DC 5.0V, AC 50V
Rated Power	0.01W
Linearity Tolerance	less than ±5%
Sliding Noise	less than 300mv
Insulated Resistance	⩾100MΩ,DC250V , 1minute
Withstand Voltage	1 minute at AC 250V

Mechanical Characteristics

Total Rotation Angle	360°
Rotational Torque	20mN·m
Pull Strength of Shaft	5N, 3sec
Push Strength of Shaft	30N, 3sec

Endurance Characteristics

Storage Temperature	-30℃ to +70℃
Operating Temperature	-20℃ to +70℃
Dry Heat	70±2°C, 240±2 hr, -30%⩽ ▵TR⩽+5%
Cold	-30±2°C, 300±5 hr, without load,▵TR±20%
Damp Heat	70±2°C, 85%RH,300±5hr, -5%⩽▵TR⩽+35%
Temperature Cycle	-10~+70°C, 5 cycles, ▵TR⩽±10%
Operating Life	Standard life: 300,000 cycles Long life: 1,000,000 cycles
Temperature Characteristic	70±3°C, 5 hr, -20%⩽▵TR⩽+5%
Soldering Condition	Wave soldering: 255±5°C 3sec Manual soldering: 345±5°C 3sec
Operating Temperature Range	-20°C~+70 °C

HOW TO ORDERD

FSE04-	P	1	B	5K	Z0
Model Series	Terminal Configuration	Terminal Length	Resistance Taper	Total Resistance	Electrical Angle Code
	P: SMD type	1: 1.5mm	B: Linear B	5k 10k	Z0： 280°

FSE04