



# 东莞市凡睿电子科技有限公司

DONG GUAN RUI FENG TECHNOLOGY&ELECTRONICS CO., LTD.

TEL: (0769) 81805438/86866001 13751429385 FAX: (0769) 82991458 E-mail: fanrui@dgfanrui.com

网址: <http://dgruifengkj.1688.com>

<http://www.dgfanrui.com>

地址: 广东省东莞市茶山镇京山第三工业区二路3号

## 承认书 FOR APPROVAL

客户名称(Customer's Name): \_\_\_\_\_

客户摘要(Customer Note): \_\_\_\_\_

承认编号

Samp les lot No.:FR220113

送样日期:

Issus Date: 2022-01-04

### 客户确认回复/Evaluation Results

客户品名	客户料号	确认	核准	贵公司盖章
OK(判定可用)	NG(不可使用)			

如诚蒙贵公司确认合格，敝司将按样品进行生产交货，如规格有变请提前通知！

### 以下为凡睿资料 FANRUI INFORMATION

机种类别(Product): RK166 旋转式电位器

产品规格(Part No.): RK166NH01-M7B6.5-FC20A12-B25K60° ±20%-L1

物料编码(Materiel No.): 802030016

产品图号(Drawing No.): CPT-16-016

摘要(Note):

凡睿电子科技有限公司专业生产销售各种编码器，电位器及多路旋转开关，公司从前期的产品开发，模具制做，到后期的零件生产，成品组装及销售为一体的一站式完成。并可根据客户要求设计开发各种编码器，电位器及多路旋转开关。欢迎来电咨询！	业务员 Sales Department	曾海发
	承办 Prepared By	陈炯
	审核 Proofed By	吕单
	核准 Checked By	刘建国

凡睿，竭诚为您服务！欢迎来电咨询！



# 东莞市凡睿电子科技有限公司

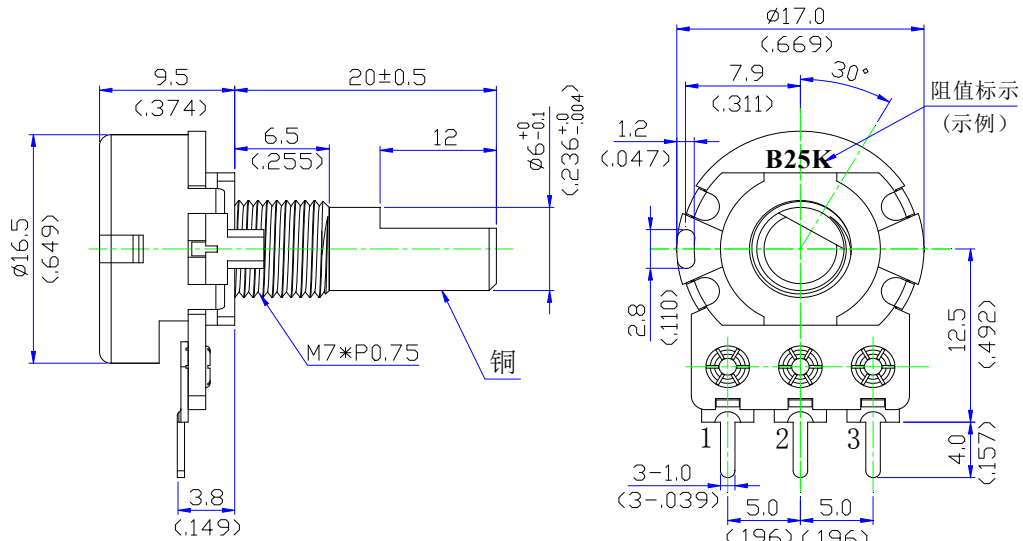
DONG GUAN RUI FENG TECHNOLOGY&ELECTRONICS CO., LTD.

TEL: (0769) 81805438/86866001 13751429385 FAX: (0769) 82991458 E-mail: fanrui@dgfanrui.com

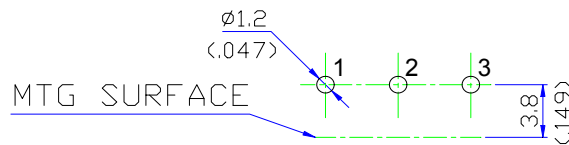
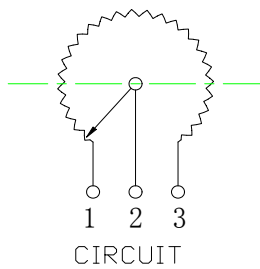
网址: <http://dgruifengkj.1688.com>

<http://www.dgfanrui.com>

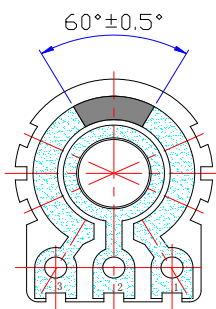
地址: 广东省东莞市茶山镇京山第三工业区二路3号



FULL C.C.W POSITION



MOUNTING HOLE DETAILS



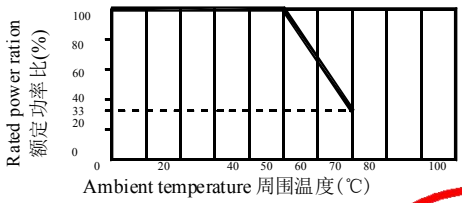
Carbon effective Angle



东莞市凡睿电子科技有限公司 DONG GUAN FAN RUI ELECTRONICS&TECHNOLOGY CO.,LTD.				③			
				②			
				①			
Title	RK166 Series			Devision	Date	Design	
Code	802030016						
Dwg Name	RK166NH01-M7B6.5-FC20A12-B25K60° ±20%-L1			Unit	Scale	TOLERANCE	
Dwg No	CPT-16-046	Version	A	MM	3:1	UNDER 10	±0.3
DESIGN	CHECK	APPROVAL		MTL		10~100	±0.5
				SPEC		OVER 100	±0.8
				DISPOSAL		ANGULAR DIMENSION	±5°

# RK166 SERIES GENERAL SPECIFICATION

## RK166 系列规格书

1、GENERAL 一般事项		
1.1、Scope The specification applies to model RK166 type mainly used for consumer products	适用范围 此规格书适用于 RK166 机型	
1.2、Operating temperature range	使用温度范围 -10℃~70℃	
1.3、Storage temperature range	保存温度范围 -20℃~55℃	
1.4、Test conditions: Standard atmospheric conditions:	试验状态 标准状态	
Unless otherwise specified,the standard range of atmospheric conditions for making measurements and test is as follows: Ambient temperature:5~35℃ Relative humidity:45~85%	无特别规定之实验及测定时以温度 5~35℃, 相对湿度 45~85%, 气压 86~106kpa 之标准状态测定。	
Air pressure:86kpa to 106kpa If there is any doubt about the results,measurements shall be Made within the following limit: Ambient temperature:20±2℃ Relative humidity:60~70% 定。 Air pressure:86kpa to 106kpa	发生判定疑问或另有特别要求则以 基准状态 (温度 20±2℃, 相对湿度 60~70%, 气压 86~106kpa) 为标准测	
1 ELECTRICAL CHARACTERISTICS 电气特性		
Item 项目	Conditions 条件	Specifications 规格
1、Nominal total resistance and tolerance 公称全阻抗值	The resistance between terminals 1 and 3 shall be measured 端子 1-3 间阻值测定。	25K Ω ±20% ±__%
2、Resistance law 阻抗变化特性	Measurement shall be made by the resistance law method. For other procedures(refer JISC5261 standard) 用电压法测试, 参照 JISC5261 标准	B Taper 线性 See the potentiometer curve on the last page 参见最后一页电位器曲线图
3、Power rating 额定功率	Power rating is based on continuum full load operation at the maximum voltage between terminals 1 and 3 . Power rating vs.ambient temperature shall be denoted on the following graph. 端子 1-3 间连续负载后的最大功率。 环境温度对功率影响的曲线如下图表示: 	<input checked="" type="checkbox"/> B taper: 0.2W B 曲线: 0.2W <input type="checkbox"/> Other taper: 0.1W 其它曲线: 0.1W
4、Rated voltage 额定电压	Rated voltage 额定电压: $E = \sqrt{PR}$ Power rating P: 额定功率 (W) Nominal total resistance R: 公称阻抗值 (Ω) When the rated voltage exceeds the maximum operating voltage, the maximum operating voltage shall be the rated voltage. 额定电压大于最高使用电压时,最高使用电压作为额定电压。	Maximum operating voltage 最高使用电压 200V AC
5、Residual resistance 残留电阻	Contact brush stop at the end of the (A). Resistance between terminals 1 and 2, terminals 2 and 3 shall be measured. A: Angle of effective rotation 接触刷停留在(A)终端位置,在端子 1-2 间,端子 2-3 间测定之电阻值。 A:有效回转角度	R1,2: ≤20 Ω less R2,3: ≤20 Ω less 以下
6、Rotational noise 转动噪音	Apply DC 20V between terminals 1-3 to measure the noise voltage (rated voltage ≤20V apply by rated voltage). 在端子 1-3 间加直流电压 20V(额定电压≤20V,则以额定电压值测试)后,测定的杂音电压。 Shaft rotation : 1 rotation / 3S 轴转速:1 回转/3 秒	100mVp-p or less ≤ 100mVp-p 以下

# RK166 SERIES GENERAL SPECIFICATION

## RK166 系列规格书

1 ELECTRICAL CHARACTERISTICS 电气特性		
Item 项 目	Conditions 条 件	Specifications 规 格
7、Tracking error 连动误差	<p>The voltage of 2 V r.m.s. Shall be applied between terminals 1 and 3 and between terminals 1' to 3' by measuring frequency at 1KHz. The output voltage shall be measured between terminals 1 and 2 and between terminal 1' and 2'(for the 15C and 25C taper. the measurement shall be made between terminals 2 and 3 and between terminals 2' and 3'). it should be the same standard with the first measuring result .</p> <p>If there is not any doubt about the results . This DC voltage shall be used as the test voltage.</p> <p>在端子 1-3 间,1'-3'间,输入频率 1KHz,电压 2V 的正弦波实值,测量端子 1-2 间,端子 1'-2'间的输出电压(适用于 15C 和 25C 线型,端子 2-3 间,2'-3'间也应测量输出电压) 结合第一次的测量结果,应为同一标准. 如对测量结果没有质疑, 则将此电压作为测试电压值。</p> <p>Input impedance of the voltmeter: 10M <math>\Omega</math> or more 电压表输入阻抗 10M <math>\Omega</math> 以上</p> <div style="text-align: center;"> </div>	<p>Multi-circuit tracking error: R1,2: -/_~0<math>\leq</math><math>\pm</math> _/_dB R3,4: -/_~0<math>\leq</math><math>\pm</math> _/_dB R5,6: -/_~0<math>\leq</math><math>\pm</math> _/_dB</p>
8、Insulation resistance 绝缘阻抗	Apply voltage of 500V DC and measure for 1 minute	<p>Between individual terminals and frame 端子-固定板</p> <p>100M <math>\Omega</math> or more 100M <math>\Omega</math> 以上</p>
9、Dielectric strength 耐电压	Measuring frequency : 50~60Hz ; 500V AC for 1 minute.	<p>Between individual terminals and frame 端子-固定板</p> <p>Electrical characteristics shall be satisfied with specification. 电气性能符合规定要求</p>
<b>2 MECHANICAL CHARACTERISTICS 机械特性</b>		
1、 Total mechanical rotation 全回转角度	Angle of effective rotation 有效旋转角度	300 $\pm$ 10 $^\circ$
2、 Rotational torque 旋转力矩	<p>Rotational speed 旋转速度 S 旋 转速度 60/S</p> <p style="text-align: center;">Standard atmospheric conditions 常温 5<math>^\circ</math>C 至 35<math>^\circ</math>C</p>	20~200 gf.cm
3、 Number of Detents Click 定位数目	<p>For with-detent type. 加中段功能机种使用</p>	<input type="checkbox"/> 1C(Center Detent 中段功能) <input type="checkbox"/> 11C <input type="checkbox"/> 21C <input type="checkbox"/> 41C
4、 Click slip out force 定位推动力	<p>For with-detent type. 加中段功能机种使用</p>	50~300gf.cm
5、 Terminal strength 端子强度	A static load of 1.2kgf shall be applied to the terminals for 10 Seconds in any direction(After fixation). 固定后与端子加 1.2kgf 的力矩并保持 10 秒	<p>Electrical characteristics shall be satisfied with specification 电气性能符合规定要求</p>
6、 Shaft stop strength 止档强度	The following torsion moment load of (metal)6kg, (plastic)3kg shall be applied to the shaft for 5sec at both ends. (After fixation). 固定后与轴转至末端加(金属)6Kg(塑胶)3Kg 力矩并持续 5 秒。	<p>Electrical characteristics shall be satisfied with specification. 电气性能符合规定要求</p>
7、 Shaft push & pull strength 轴向推拉强度	Push & pull static load of 5kgf.cm shall be applied to the shaft in vertical with axial directions for 10 seconds.(After fixation). 固定后与轴垂直的端面方向加 5Kg 并保持 10 秒。	<p>Shaft without damage, rotational torque. without abnormality . Electrical characteristics shall be satisfied with specification 轴无破损, 旋转无异常。 电气性能符合规定要求</p>

# RK166 SERIES GENERAL SPECIFICATION

## RK166 系列规格书

2 MECHANICAL CHARACTERISTICS 机械特性		
Item 项 目	Conditions 条 件	Specifications 规 格
8、Nut tightening strength 螺母紧固强度		Metal $\geq 8\text{kgf.cm}$ plastic $\geq 4\text{kgf.cm}$
9、Shaft wobble 轴摆动	A momentary load of 500gf.cm shall be applied at the point 5 mm from the tip of the shaft in a direction perpendicular to the axis (after fixation) 固定后在与轴垂直的端面 5mm 处施加 500gf.cm 静载荷	0.7 x L / 30 mm p-p L: 固定面到测试点的距离 L is the length between mounting surface and measuring point .
3 ENDURANCE CHARACTERISTICS 耐久性能		
Item 项 目	Conditions 条 件	Specifications 规 格
1、Solder ability 焊锡性	The terminals shall be stored at a temperature of 40°C with relative humidity of 90~95% and measured in 168 hours. 温度 40°C, 湿度 90~95%RH, 168 小时测定。 The terminals shall be immersed into solder bath at 230°C $\pm$ 5°C for 3 $\pm$ 0.5S 端子在 230°C $\pm$ 5°C 温度的焊锡槽内浸锡 3 $\pm$ 0.5 秒	A new uniform coating of solder shall cover 75% minimum of the surface being immersed. 浸渍面须有 75% 以上焊锡附着
2、Resistance to soldering heat 焊锡耐热性	Soldering method 手焊条件: Soldering temperature 手焊温度: 300°C $\pm$ 10°C Application time of soldering 时间: 3 $\pm$ 1 秒 When Soldering For The Part With switch, The Switch Should Be At On Status. 带圆形基板的开关产品, 焊锡时开关应处于接通状态, 不能处于关闭状态 Substrate to be soldered: Cooper clad laminated phenol in one surface of 1.6mm thickness, Do not use double sided through PCB. Preheating: Surface temperature of substrate shall be settled within 100°C in one minutes. 使用基板: T=1.6mm 厚单面铜泊积层板面。 预热: 基板表面温度 100°C 以下, 1 分钟以内。 Wave soldering: 波峰焊条件: Bit temperature 温度: 260 $\pm$ 5°C Application time of soldering 时间: 1 $\pm$ 1 sec	Change in total resistance is relative to the value before test : $\pm 5\%$ Without visual deformation or terminals losing, Electrical characteristics shall be satisfied with specification 总阻变化值: $\pm 5\%$ 外观无变形, 端子无松动, 电气性能符合规定要求
3、Resistance to heat 耐热性	The potentiometer shall be stored at a temperature of 70°C $\pm$ 2°C for 240 $\pm$ 8H in a thermostatic chamber. Then the potentiometer shall be measured after maintaining at standard atmospheric conditions for 1.5H, in order to remove surface moisture. 温度 70°C $\pm$ 2°C 恒温槽中 240 $\pm$ 8 小时放置后, 置于常温常湿 1.5 小时除去水滴后测定。	Change in total resistance is relative to the value before test : $\pm 20\%$ 总阻变化值: 初期值的 $\pm 20\%$
4、Resistance to cold 耐寒性	The potentiometer shall be stored at a temperature of -25 $\pm$ 3°C for 96 $\pm$ 4H in a thermostatic chamber. Then the potentiometer shall be taken out of the chamber and its surface moisture shall be removed. And measure the potentiometer which shall be subjected to standard atmospheric conditions for 1.5H. 温度 -25 $\pm$ 3°C 恒温槽中 96 $\pm$ 4 小时放置后, 置于常温常湿 1.5 小时除去水滴后, 1.5 小时内测定。	Change in total resistance is relative to the value before test : $\pm 20\%$ 总阻变化值: 初期值的 $\pm 20\%$
5、Damp heat 耐湿性	The potentiometer shall be stored at a temperature of 40 $\pm$ 2°C, with relative humidity of 90% to 95% for 96 $\pm$ 4H in a thermostatic chamber. Then the potentiometer shall be taken out of the chamber and its surface moisture shall be removed..and measure the potentiometer which shall be subjected to standard atmospheric conditions for 1.5H. 温度 40 $\pm$ 2°C, 湿度 90-95%, 恒温恒湿槽中放置 96 $\pm$ 4 小时后, 置于常温常湿 1.5 小时除去水滴后, 1.5 小时内测定。	Change in total resistance is relative to the value before test : +35%,-5% 总阻变化值: 初期值的+35%,-5% Insulation resistance: 10M $\Omega$ or more 绝缘阻抗: 10M $\Omega$ 以上 Rotational Noise: 150mV p-p less than 转动噪音: 150mV p-p 以下

# RK166 SERIES GENERAL SPECIFICATION

## RK166 系列规格书

Item 项 目	Conditions 条 件	Specifications 规 格
6、Endurance 耐久性	The moving contact without electrical load shall be rotated from one end stop to the other and returned to its original position exceeds 90% of effective angle. This procedure constitutes 1 cycle. And the moving contact shall be subjected to 600 cycles per hour. total 500,000±5000 cycles.(5000 to 8000 continuous cycles for 24H). 轴以 600 周/小时(来回算 1 周)的速度旋转,24 小时旋转 5000~8000 周,有效旋转角度超过 90%,共 500,000±5000 周.	Variable Value of Total Resistance: specified value±15% 总阻变化值: 规格值范围的±15%  Noise 150mV p-p less than 转动噪音: 150mV p-p 以下  Rotational torque shall not deviate from the previously specified value. 回转力矩满足规格值

### 4. SWITCH PERFORMANCE (FOR WITH- SWITCH TYPE)

开关性能(适用于带开关机种)

Item 项 目	Conditions 条 件	Specifications 规 格
1、Switchcontact resistance . 开关接触电阻		≤50m Ω
2、Switch power rating 开关承受负载		≤12V DC 1A
3、Insulation resistance 绝缘阻抗	Apply voltage of 500V DC and measure for 1minute Between individual terminals and frame 端子-固定板	100M Ω or more 100M Ω 以上
4、Dielectric strength 耐电压	Measuring frequency : 50~60Hz; 500V AC for 1 minute. Between individual terminals and frame 端子-固定板	Electrical characteristics shall be satisfied with specification. 电气性能符合规定要求
5、Switch working angle 开关工作角度		35°±5°
6、Switch working torque 开关工作力矩		70~400gf.cm
7、Switch Endurance 开关耐久性	<input type="checkbox"/> 15,000 Cycles min <input type="checkbox"/> Other ___ Cycles min	Contact resistance 200mΩ Max, To be operated mechanically. 接触阻抗最大 200m Ω ,

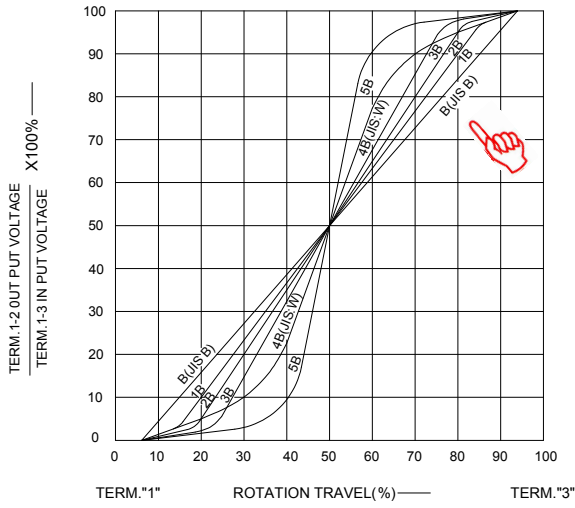
### 5. Packing Portion 包装部分

Packing 包装方式	Use plastic bag packing 使用胶袋包装	100PCS per bag, 6 bags per small box, 4 small boxes per box A total of 2400 PCS 每袋 100PCS, 每小盒 6 袋, 每箱 4 小盒 共计 2400PCS
-----------------	-----------------------------------	---

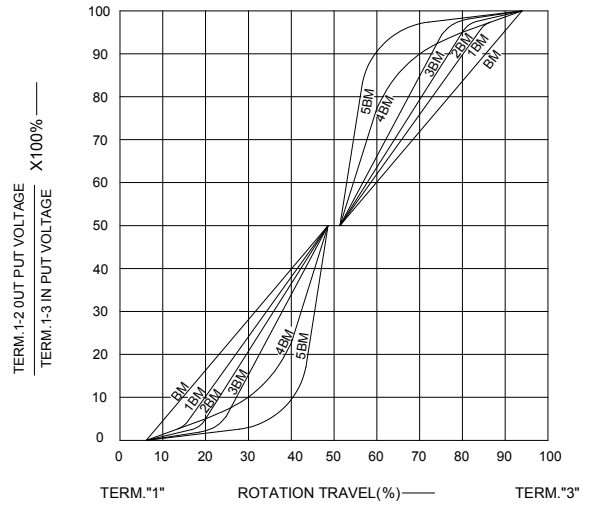
REVISION 变更记事	变更时间	 <b>东莞市凡睿电子科技有限公司</b>			
		DSGD.主办	CHKD.审查	APPD.核准	TITLE 标题:
					POTENTIOMETER 电位器规格书
					Model 机种:
					RK166 系列

# 电位器曲线图

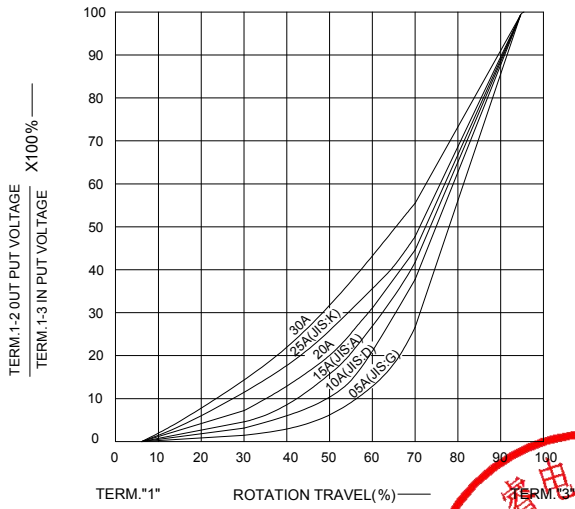
TAPERS B SERIES



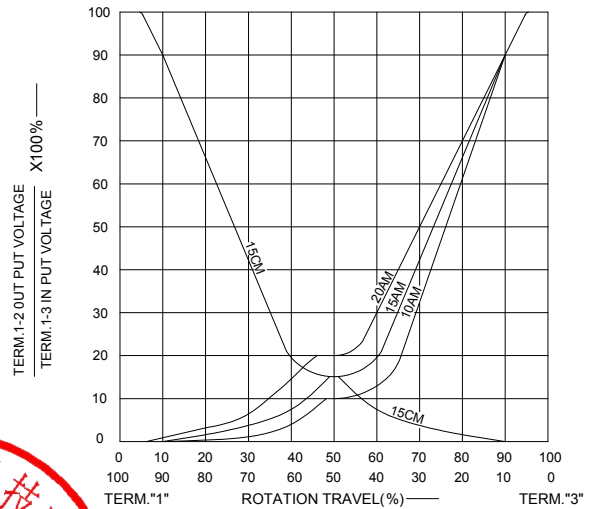
TAPERS B WITH 50% TAP



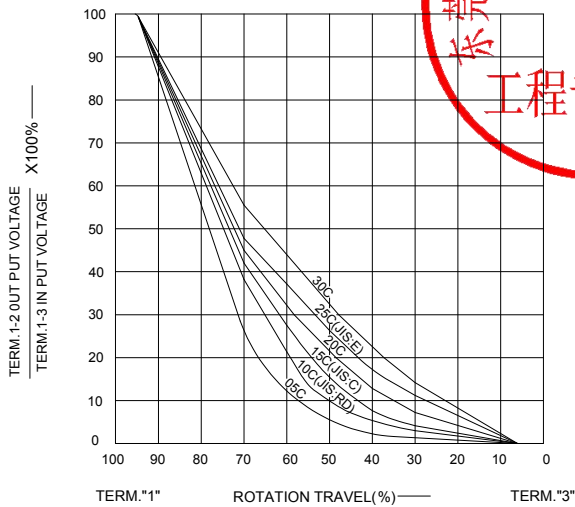
TAPERS A SERIES



TAPERS A&C WITH 50% TAP



TAPERS C SERIES



TAPERS M&N

